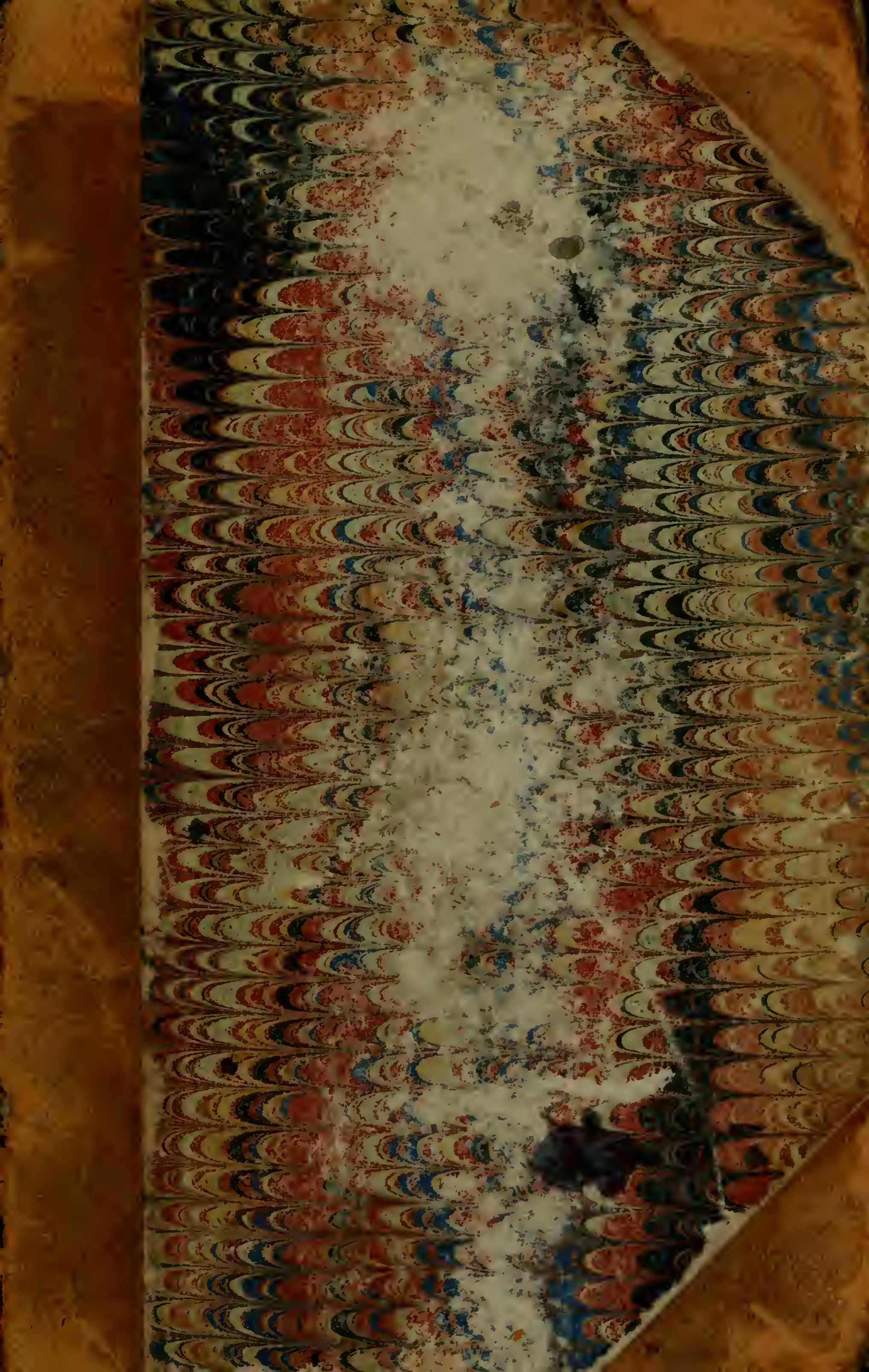

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WILLIAM PROCTER, JR.

Professor of Pharmacy in the Philadelphia College of Pharmacy.

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THE

AMERICAN JOURNAL OF PHARMACY.

JANUARY, 1860.

ON OXALATE OF CERIUM.

By Ferd. F. Mayer, of New York.

This preparation, heretofore a *rara avis* even in a chemical laboratory, is now coming into use as a remedy for obstinate vomiting in pregnancy, for which purpose it has been highly recommended by Professor Simpson, of Edinburgh.* It is given in doses of from one to two grains in the form of pills, three times a day, and is said to require but a very few doses to give relief.

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* The drug I refer to is *oxalate of cerium*, which I have seen successful in curing vomiting in a larger proportion of cases than any other single remedy which I have used; and its good effects are not confined to the forms of vomiting which depend on the sympathetic derangements of the stomach caused by changes, functional or pathological, in the uterus or other organs, but are manifested also in those forms of the disease which are due to different morbid conditions of the stomach itself. Cerium is, as you know, one of those rare and little-known metals which were first discovered in the early part of the present century, and is found chiefly in the Scandinavian mines, combined in small proportions in various minerals. I believe that any of the other preparations of the metal would fulfil the indication equally as well as the oxalate, which is used simply because it is the most easily procurable salt of cerium in the market; oxalic acid being used to separate the cerium from the metal with which it is most generally combined in nature, namely, didymium. The action of cerium on the stomach seems to be that of a sedative tonic, resembling in some degree the action of the salts of silver, and bismuth; and I have seen it succeed in curing the most obstinate cases of vomiting so much oftener, and so much more speedily than any other remedy, that I have come of late to have great faith in its employment. I would not lead you to suppose that by the administration of a quantity of oxalate of cerium you will succeed in curing every case of vomiting, or even in alleviating it in every case; but I am certain that you will find the remedy successful in a larger majority of instances than you will find any other one drug. You may give one or two

It is safe to say that the oxalate of cerium, or any other preparation of this metal, have been seen but by few of our pharmaceutists, and that the formulas for their preparation as contained in the text and hand-books, including Gmelin, will not produce a pure compound, nor is the material from which the metal is to be obtained to be had every day. The latter circumstance, however, does not stand in the way of the introduction of the preparation as a remedy, since the doses used are very small, and the stock now in market will be found sufficient for the period of trial which it will undergo previous to its more general application.

Cerium occurs principally in two minerals, one of them, *Cerite*, exclusively in Sweden; the other, *Allanite*, also in this

grains of it, three times a-day or oftener, in the form of a pill, or mixed with a few grains of gum tragacanth, in the form of a powder. The vomiting usually ceases after a few doses have been taken; but in some cases it does not abate till the remedy has been persevered with for several days. The effect is sometimes instantaneous. I had a patient some time ago from the west of Scotland, and when her husband first came to ask me to visit her I was engaged and could not go, but after hearing his account of the case, I gave him a prescription for cerium pills, which I desired him to administer to his wife till I could get to see her. He came back next morning, asking what the medicine was which I had given him, for the effect of it had been like magic. The vomiting, which had been going on almost incessantly, and which nothing seemed to have any power of alleviating, ceased upon the administration of two doses of the cerium. In a previous pregnancy in this patient it had been made a question for a medical consultation whether abortion should not be induced, to save her from the effects of uncontrollable sickness and vomiting. But the good result is, unfortunately, not always so immediate. One of the earliest cases in which I employed it was in the case of a lady who came from Greenock, when she was pregnant for the fourth time, and had arrived to between the third and fourth months of gestation. For these three or four months she had been always vomiting many times a-day, and often during the night also; and that whether the stomach was empty or full. She could take but very little food, for she always sickened at the sight of it. It had been the same in all her former pregnancies; and on the occasion of the first of them the vomiting was so severe as to bring on a miscarriage, and the patient's own country, near Bethlehem, Pa., and Monroe, New York. Prof. Silliman, Jr., informs me that he had caused to be collected at the latter place during the past year a notable quantity for Prof. R. Bunsen, who has lately published an interesting paper on the preparation of pure cerium-compounds, as have Vogler and Jegel.* The processes for this preparation are tedious enough to excuse me from recounting the various methods given elsewhere, and I will at once proceed to give what appears to me the most expeditious and satisfactory.

Prof. Simpson does not state expressly whether the oxalate of cerium he uses is that of the protoxide or peroxide; but I judge it to be the former from a sample of the Edinburgh preparation, which, by the by, contains a considerable proportion of *lanthanium*, a circumstance which may have no bearing on the action of the medicine.

The mineral commonly used, and the one I obtained for this

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life was despaired of. She got, first of all, one grain of oxalate of cerium, but vomited three hours afterwards. She was then told to take a grain every three hours for a day, and afterwards one grain thrice a-day. This was successful in checking the vomiting, and a few days afterwards she left Edinburgh, feeling quite well, eating her meals heartily, and free from all sickness. Everything had been tried by different Medical men in the West which afforded any prospect of relief, as creosote, prussic acid, bismuth, lime-water, ice, champagne, opium, blisters, etc., but all without effect. The only thing from which she ever experienced any benefit, and that was only very transient and temporary, was calcined magnesia. Yet, as I have told you, it required only a very few doses of oxalate of cerium to produce a perfect cure. Shortly afterwards I saw, with Dr. Craig, of Ratho, a case of severe and persistent vomiting in pregnancy, where he had tried everything; but in vain. She, too, was cured by a few doses of cerium. When the propriety of entering this and other modern remedies in the new Pharmacopœia to be published by the Medical Council was lately debated, it was objected that so little of the drug is used that it is not worth while classifying it among the other recognized medicinal agents. But on making inquiry lately at the drug shop of Messrs. Duncan, Flockhart & Co., in this city, I was told that they had sold as much as sixty-four ounces during the preceding twelve months, and I feel assured that it only requires to be more widely known to make it more extensively esteemed and employed as a general metallic sedative tonic.—*Med. Times and Gazette, Sept.* 17*th*, 1859.

* Annalen der Chemie u. Pharmacie, Vol. cv. 40, 45; Chemical Gazette, 1858, p. 221.

purpose is *Cerite*, a basic hydrated silicate of the cerium-metals, (cerium, lanthanium and didymium,) with small portions of lime, iron, magnesia, yttrium, copper, bismuth, molybdenum, phosphoric acid. The oxides of the cerium-metals amount to 67 per cent. of the whole, that of cerium making up about three-fifths of that proportion.

This silicate is reduced to very fine powder, placed in a comparatively capacious porcelain dish, and with strong oil of vitriol, by the aid of a porcelain spatula or glass rod, formed into a paste. The dish is then put over a lamp or sand-bath, and heated until the mass ceases to swell up and no longer absorbs any oil of vitriol, which latter must be added very cautiously, to prevent accidents. When this reaction is over, and the mass, now a greyish cake, is cooled, it is to be dried and powdered and placed in a Hessian crucible, in which it is exposed to the heat of an anthracite stove-fire, until it has assumed a pale brownish red color. It is now lixiviated with hot water, and subsequently with dilute nitric acid, and the solution treated with sulphuretted hydrogen to precipitate the heavy metals (copper, bismuth, molybdenum). To the clear liquid some hydrochloric acid is added (enough to hold in solution the oxalate of lime, etc.,) and a solution of oxalic acid, which precipitates oxalates of protoxide of cerium, and of oxide of lanthanium, and didymium in form of curdy flakes, soon falling to the bottom as a pale, pinkish crystalline powder. This is washed with warm water, then transferred to a mortar and formed into a paste with one half the weight of the mineral in carbonate of magnesia, which paste is dried on a porous fire-brick, then rubbed fine, and calcined in an open stove until the powder has assumed the color of cinnamon. In this condition it contains all cerium in the form of peroxide, which readily dissolves in concentrated nitric acid, carefully to be added in a beaker, to prevent loss by effervescence, and heated by the water-bath. This solution is freed, to some extent, of the large excess of acid by evaporation in the same vessel, and after due dilution with some water is poured into a vessel containing *boiling* water to which a little more than ½ per cent. of oil of vitriol has been added. There should be about a quart of water to every ounce of the mineral worked. When the cerium-metals in solution are thus brought together with dilute sulphuric acid, a yellow precipitate of basic sulphate of the peroxide of cerium —$2\,Ce_2\,O_3, SO_3 + 6\,Aq$—is formed, while a little of the neutral sulphate of the same oxide, and all the lanthanium and didymium remain in solution.

The yellow basic sulphate soon settles when the vessel is removed from the fire, and is washed by decantation with hot water acidulated by the same proportion of sulphuric acid. When thoroughly settled, the precipitate dissolves readily in stronger sulphuric acid, forming a yellow liquid which contains only peroxide of cerium. This I reduce to protoxide by digesting it with a few crystals of hyposulphite of soda, of which it takes but little to remove the yellow color of the cerium salt by the sulphurous acid disengaged. The liquid is then filtered and the oxalate of the protoxide of cerium precipitated by oxalic acid, washed with warm water, filtered and dried.

The dilute solution of the cerium-metals in sulphuric acid and the washings from the precipitation of the basic sulphate, retain a considerable portion of per-sulphate of cerium, which is obtained for the greater part by evaporation of the fluids to one-half. If reduced to a less bulk, sulphates of the other metals will crystallize out, which can only be separated by again precipitating a basic persulphate of cerium as described above.

Oxalate of the protoxide of cerium is a snow-white powder, and consists of

$$2\,CeO + C_4\,O_6 + 6HO = \begin{array}{rl} 46{\cdot}14 & CeO \\ 30{\cdot}78 & \bar{O} \\ 23{\cdot}08 & HO. \\ \hline 100{\cdot}00 & \end{array}$$

It is insoluble in water, but dissolves in sulphuric acid, by which it is distinguished from other insoluble salts of the earths, and its solution yields a precipitate with caustic alkalies even in presence of chloride of ammonium, which is not soluble in an excess of the precipitant.

New York, *Dec*, 1859.

ANALYSIS OF RED SANDAL WOOD.

By H. Dussance, of New Lebanon, N. Y.

(Abridged by the Editor, from an elaborate original paper, at the request of the Author.)

Red Saunders or Red Sandal Wood, (Pterocarpus santalinus,) is the product of a large tree growing in Ceylon, and on the coast of Coromandel, and well known to druggists as a coloring substance.

Action of water on the wood.—Sandal wood was first exhausted with cold and hot water, by repeated infusions in that liquid; 2·39 gms. lost 0·251 gms. by this treatment. The infusions subjected to distillation yielded a distillate having the odor of musk, due to a volatile oil, and having an acid reaction due to free acetic acid, as determined by distilling its baryta salt with SO^3.

The residuum in the retort was evaporated to dryness and incinerated. It yielded a white ash; the part soluble in water contained carbonate and sulphate of potassa, and the chlorides of potassium and sodium. The part insoluble in water contained silica, sesquioxide of iron, alumina and sulphate of lime.

Another portion of the infusion of sandal wood was examined further for organic proximate principles. It was warmed with hydrated oxide of lead, which removed the coloring matter and free acid. The liquid was filtered and the deposit of oxide of lead, etc., washed.

The clear liquid and washings, by distillation, yielded the volatile oil before noticed. The concentrated liquid was found to contain the *acetates of lime* and *potassa*, when tested with oxalate of ammonia, bichloride of platinum and sulphuric acid. A portion of it when concentrated became coated with an elastic pellicle, which when warmed with potassa disengaged ammonia, and which afforded a precipitate by solution of galls and acetate of lead. The taste of the concentrated liquid indicates sugar, and when it is thrown into alcohol it is abundantly precipitated, the precipitate being soluble in water.

The oxide of lead precipitate was suspended in water and decomposed by sulph-hydric acid gas, the liquid filtered and boiled. This when concentrated and tested with liquor potassæ, gives a precipitate soluble in hot water. Lime water gives a precipitate; chloride of calcium none, unless the liquid is previously saturated with ammonia, when a white precipitate occurs. These characters indicate *tartaric acid.*

By subsequent quantitative experiments the proportion of these constituents were determined to be as follows, viz:

2390 parts of red sandal wood exhausted by cold water affords 251 parts of soluble matters constituted thus:

Volatile oil and free acetic acid .	46	parts.
Coloring matter, ...	90	"
Albumen, ...	9	"
Tartaric acid, ...	1	"
Sugar and gum, ...	80	"
Acetate of potassa, . . .	9	"
Acetate of lime, ...	10	"
Salts, (chlorides, sulphates, &c.,) .	6	"
	251	

Action of alcohol on the wood exhausted by water.—Red sandal wood, after exhaustion by water, was dried, and then treated first with alcohol (95 per cent.) cold, and afterward at boiling, till thoroughly exhausted, and the mixed blood red liquids evaporated to dryness. The dry extract digested with water was not affected by it. It was then dried and treated with ether, which dissolved a resinous matter and a little coloring matter. Water precipitates the coloring matter and resin together from the tincture and cold ether separates the resin from the coloring matter.

1986 parts of wood exhausted by water then yielded to alcohol 311 grs. of extract. This was redissolved and treated with a large excess of lead, and the precipitate occasioned well washed with alcohol. The liquors evaporated to dryness yielded 61 parts of resin. The lead precipitate dissolved in acetic acid was diluted with water, which precipitated the coloring matter, and retained the lead in solution. When washed and dried the coloring matter amounted to 250 parts.

Action of hydrochloric acid.—The wood exhausted by water and alcohol was treated with cold hydrochloric acid 15° B. during twenty-four hours, and renewed till it ceased to dissolve. The acid solution was super-saturated with ammonia, which occasioned a precipitate, and which was collected, well washed, dissolved in hydro-chloric acid, the solution accurately saturated with ammonia and divided into several portions.

Chloride of calcium indicated oxalic acid. Sulphate of magnesia and ammonia indicated phosphoric acid, oxalate of ammonia indicated lime, and the liquid filtered from the oxalate of lime gave with ammonia a precipitate of magnesia.

By subsequent quantitative experiments the author determined the proportion of these salts in 1675 parts to be 50 parts of oxalate of lime, 20 parts of phosphate of lime and 30 parts of phosphate of magnesia, with about five parts of coloring matter left by the alcohol.

Action of fire on sandal wood exhausted by water alcohol and hydrochloric acid.—The wood exhausted by the three preceding processes was decomposed and gave the ordinary products of the distillation of wood, and an *ash:* 1570 parts of the wood gave 29 of ash, consisting of *silica* and *carbonate of lime*, the parts destroyed by the fire amounting to 1541 parts of *lignin.*

It results from the preceding experiments that sandal wood has the following complex composition, viz:

100 parts of the wood contain:

Matters soluble in water,	10.50	parts.
" " Alcohol,	13.97	"
" " Hydrochloric acid,	4.72	
" insoluble,	70.81	
	100.00	

These 100 parts are in detail as follows:

Soluble in water.	Volatile oil and acetic acid,	1.92
	Coloring matter,	3.76
	Salts,	0.25
	Albumen,	0.37
	Tartaric acid,	0.04
	Acetate of potassa,	0.37
	Acetate of lime,	0.41
	Sugar and gum,	3.38
Soluble in alcohol,	Coloring matter,	11.23
	Resin,	2.74

Soluble in hydro-chloric acid	Oxalate of lime,	2.24
	Phosphate of lime,	0.89
	Phosphate of magnesia,	1.34
	Coloring matter,	0.25
Insoluble	Lignin,	69.50
	Ashes,	1.31
		100.00

Conclusions.—The author remarks that the coloring matter, which may be called the active principle, is very intimately combined with the ligneous, resinous and saline matters.

The *santalin* of M. Pelletier, he considers to be impure, and to contain resin. The difficulty has been to free it from this substance. The author has obtained santalin perfectly definite in its composition, differing in its composition and physical properties from the santalin of Pelletier which is used in France under the name of *Vegetable Indian Red.*

The authors results lead him to consider pure santalin as a nitrogenous body having close relationship with indigotin; it forms similar compounds, sulpho-santalinic acid, which is prepared like sulpho-indigotic acid, and in this form it can most advantageously be employed by the dyer.

The author proposes to continue the study of santalin in a second paper, and believes that plants should be first carefully analysed proximately before their separate principles are clearly studied. He has examined three other specimens of red sandal wood with the following general results, viz:

	I.	II.	III.
Volatile oil and acetic acid,	1.70	1.90	2.10
Albumen,	0.50	0.40	0.30
Sugar and gum,	4.50	3.60	3.20
Coloring matter,	19.00	16.00	21.60
Resin,	2.85	3.00	3.30
Tartaric acid,	0.85	0.00	0.07
Salts,	2.10	4.46	2.03
Lignin,	69.30	70.64	67.40
	100.00	100.00	100.00

ON MONSEL'S PERSULPHATE OF IRON.

By George S. Dickey, Jr., of San Francisco, Cal.

To the Editor of the American Journal of Pharmacy:

Dear Sir,—Accompanying this, please find a sample of Monsel's salt, such as I have been making for over eighteen months past.

I give you my formula, the result of numerous experiments when I first undertook its manufacture.

℞.	Aquæ destillatæ,	℥lxxx.
	Acid. Sulph. Com.	f.℥ix. + fʒiii.
	Ferri Sulph. Puræ,	℥c. troy.
	Acid. Nitric. "	f.℥viii. or q. s.

Mix the water and sulph. acid, and dissolve in the mixture one-half of the sulphate of iron with the aid of heat. Bring up the mixture to a brisk boil, and add the nitric acid little at a time until effervescence ceases, and while still boiling add the remainder of the sulphate of iron little by little, and boil until effervescence ceases. Filter the solution, evaporate to a syrupy consistence and spread on plates of glass to dry. It requires considerable heat to dry perfectly, but is quickly dehydrated by a too long continued heat. When dry, it is necessary to detach it from the plates with a chisel.

The article has attained great celebrity here, principally as a hæmostatic and as a local application to venereal ulcers.

I have manufactured and sold more than two thousand (2000) ounces during the last year and a half, and its sale still continues, in fact increases.

I have never yet met an instance of its failure to stop bleeding when properly applied, and it is only necessary that the dry salt should be sprinkled on the wound.

I have been much surprised that it has been so long getting into use in your section, as I sent two or three samples to different parties nearly a year since.

Very truly yours,

Geo. S. Dickey, Jr.*

San Francisco, Oct. 4th, 1859.

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*The specimens of the salt received from Mr. Dickey were the finest we have seen; perfectly dry, in very thin scales, translucent and of a light reddish brown color, very soluble and astringent.—Ed. Am. J. Ph.

CERATUM CANTHARIDIS.

By William R. Warner.

Take of Spanish Flies, in fine powder,	five ounces.
Alcohol, ·817 sp. gr. (95 per cent. vol.)	q. s.
Rosin,	three ounces.
Yellow Wax,	six ounces.
Lard,	seven ounces.

Moisten the powdered flies with the alcohol and pack in a suitable percolator; gradually pour upon it the alcohol until it passes through without much color, which will require usually about two and a half pints. Then evaporate by a gentle heat to the consistency of a soft extract, add the resin, wax and lard, melt them together and, occasionally stirring, maintain at a temperature of 212° for fifteen minutes. Strain through linen to separate the extractive and other insoluble matter that may be present, and stir until cool. This cerate should have a slight greenish yellow hue, of rather firm consistency, and possessing in a perfect degree the active properties of the Spanish flies.

The above formula for Ceratum Cantharidis is offered as a substitute for the officinal cerate from its elegance and greater efficacy, which has been fully attested. Its mode of preparation is not difficult, will, perhaps, afford more uniform results, and the additional expense from use of alcohol is scarcely worth considering, as this, in manufacturing largely, may be recovered by distillation. Slight economy may be practised by the use of hot or boiling alcohol, of which much less is required to exhaust the flies of their active principle. Repeated decocting of the flies in water will afford an aqueous extract which, though containing the virtues of the fly, is not altogether eligible as a substitute for the alcoholic extract in the preparation of this cerate. The heating of the alcoholic extract with the ingredients of the cerate affords a solution of *cantharidin* in the oily matter, and at the same time a separation of the extractive.

According to the researches of Prof. Procter, the active constituent of cantharides in an *isolated* state is sparingly soluble in cold alcohol. In the process here given, however, alcohol is found to be an excellent menstruum, and does readily dissolve the *cantharidin* while it is associated with a peculiar yellow extractive matter in the fly, as is likewise the case with many other organic principles. Hence it is that though ether is a ready solvent for *cantharidin* and alcohol is not, the latter is a good menstruum for cantharides.

Philadelphia, Oct., 1859.

PRACTICAL KNOWLEDGE.

By James W. Mill.

Pharmacy is defined to be "the art of preparing and dispensing medicines." It is, therefore, the duty of its practitioner —the apothecary—to prepare the medicines which he dispenses. The faithful discharge of this duty would seem to demand that the apothecary himself should make all the medicinal preparations required in his business. This, however, in the present advanced state of the art, is impracticable, since it would require not only more time than the apothecary could well spare from his other duties, but would also involve a much larger expenditure for apparatus than the circumstances of the case would warrant.

There are, nevertheless, a great many preparations, the manufacture of which does not need the aid of costly apparatus, and these the apothecary can, and the writer believes should, make for himself, for example, the solution and acetate of potassa; citrate and ammonia-citrate of iron; citrate of iron and quinia; tartrate of iron and potassa, and such like. The writer believes also that under the guidance of authoritative formula, the skilful apothecary could make his own fluid extracts, which would, doubtless, be much more faithful representations of their respective drugs, than many of those now furnished by the manufacturing pharmaceutist. The recent very valuable report on Fluid Extracts, by Prof. Procter, at the last meeting of the American Pharmaceutical Association, and the near approach of a new edition of the Pharmacopœia, give promise, that he will not long be without an authoritative guide in the manufacture of this most important class of medicinal preparations. This is preëminently an age of pharmaceutical progress, and the apothecary who would maintain a respectable position in the ranks, must not only not forget what he has already learned, but must increase his knowledge. In no way can he more surely do this than by engaging in the actual preparation of the medicines he dispenses. Here his former stores of knowledge are called into requisition—facts, long forgotten, transpire before his eye, and this time fix themselves on his memory not soon again to be forgotten; new phenomena are observed and treasured in the mind—food for future thought; the laws of chemical science are seen silently but surely at work, effecting their wonderful and oftentimes exceedingly beautiful changes and combinations, thus at the same time affording pleasure to the eye and instruction to the mind. It is admitted that many of these preparations can be bought, ready made, of the manufacturing chemist and pharmaceutist, of good quality, and at a price not much exceeding what it would cost the apothecary to make them for himself; but it is maintained, nevertheless, that the apothecary who makes them for himself will be richly repaid in the abundant stores of real practical knowledge which he will gather from this source; and it is to be remembered that, to the apothecary, knowledge *is* money. The preparation of citrate of iron and quinia affords a good illustration of the amount of practical knowledge that may be gained in this way. Having, first of all, carefully studied the formula with the remarks appended thereto, the operator proceeds with the first step of the process—the preparation of the sulphate of iron. The sulphuric acid, iron and water, being put together and left to themselves, he will in the mean time have recourse to his Dispensatory, and thence acquaint himself with the nature of the reactions taking place, the various methods of manufacturing the salt, its chemical constitution, tests of purity, medical properties, &c. All reaction having ceased, the liquid is filtered and further treated, according to the directions of the formula, till finally is obtained a mass of beautiful bluish-green crystals of pure sulphate of protoxide of iron. In this process, particularly if he has followed that of the U. S. P., he will have had his attention directed to the great tendency of protosalts of iron, to absorb oxygen from the atmosphere, and consequently to the necessity of protecting them from its influence, as much as possible, in all those preparations wherein a pure protosalt is desired. He will also have witnessed the interesting process of crystallization, and will, very likely, be led to study out its philosophical principles, the best methods of conducting it, &c.

Having now obtained the necessary quantity of the iron salt, he proceeds to the next step of the process—its conversion into the hydrated oxide. He is, doubtless, a reader of the American Journal of Pharmacy, and therefore will select, as being the most convenient, the process of Prof. Procter for this substance, given in the March number of that Journal for 1853. Here again transpires interesting chemical changes, prominent among which he will note the rapid oxidation of the sulphate of iron by nitric acid, accompanied with the evolution of red, suffocating fumes. In studying the nature of these changes he will, in order to a clear understanding thereof, acquaint himself with the chemical properties of nitric acid and incidentally its history, mode of manufacture, &c. He will also have observed, during the washing of the oxide, that the salt of baryta continued to give unmistakable evidence of the presence of sulphate of ammonia long after the tongue had ceased to reveal it to the taste. He cannot but be struck with the delicacy of this test, and perhaps, as the value of this kind of knowledge becomes apparent to him, it may be the means of leading him to the systematic study of that most interesting and useful branch of chemical science, qualitative analysis. Another fact connected with this substance, which must not be overlooked, is its importance as an antidote to arsenic. He must inform himself of its value in this respect, its modes of administration and the best method of keeping it on hand for cases of emergency. The thoroughly washed and drained magma is now added to a definite amount of citric acid in solution, and the mixture maintained at a certain temperature till the saturation of the acid is complete. Here the reasons for this certain amount of citric acid and this limited range of temperature may be inquired into.

Upon investigation, he will find that experience has proved the solubility of the oxide to be greater within that temperature than any other, and that the proper proportions of the ingredients of all chemical formulæ are regulated by a fixed law, viz: the law of equivalent combination, by which bodies can only unite in certain invariable proportions. The further study of this subject will introduce him to the knowledge of the atomic theory of Dalton, by which he is said to have "snatched the science from the chaos of indefinite combination and bound it in the chains of number." He will also have felt the necessity of a more familiar acquaintance with chemical symbols. The next step of the process is the preparation of the requisite amount of quinia. Here it will be necessary for him to calculate the quantity of sulphate of quinia that will yield the desired amount of the alkaloid. This will furnish him with a practical illustration of the value of the law of equivalent combination, with which he had made himself familiar during the preceding process. The extensive subject of cinchona will naturally come in here for consideration, and if a knowledge of botany has not formed a part of his education hitherto he will, now feel the want of it most keenly, and perhaps, to supply this want, he will be induced to undertake the study of a science so pleasing in itself, so refreshing in its influence, and withal so fraught with usefulness and instruction. The quinia having been well washed, is now dissolved in the filtered solution of citrate of iron, evaporated to syrupy consistence, and finally spread on plates to dry. During this final process, he may be led to inquire into the theory of evaporation, the various methods of conducting it according to the objects to be attained, &c; he will also take notice that the salt in drying assumes no definite form, and is on that account classed as an amorphous substance; (in connection with the term amorphous, it may be observed that the comprehension and easy retention of the meaning of scientific terms is greatly facilitated by a knowledge of Latin and Greek; and if the operator be so fortunate as to have had a knowledge of these languages incorporated into his early education, he has reason to be thankful). The process is now brought successfully to its close, and the finished product lies before him, in all its brilliancy of appearance, delighting his eye and exciting within him a feeling of pleased satisfaction at the consciousness of its being the result of his own labor and skill.

The writer has thus endeavored to point out some of the advantages that are derived from the manufacture of one preparation; there are many others, whose preparation is equally productive of valuable knowledge, and it is to be regretted that so few apothecaries take advantage of this cheap and easy method of instructing themselves in the theory and practice of the higher branches of their art. Books are absolutely necessary, and lectures are useful, but it is only in proportion as the knowledge imparted by them can be utilized, so to speak, that they are of real value to the apothecary. It is an admitted and lamentable fact that many of those now practising pharmacy are totally incompetent to fulfil the responsibilities of the true apothecary. They know nothing of the science of preparing medicine; they have by some means or other learned to distinguish opium from rhubarb, and that by putting so much of this and so much of that together the result will be paregoric; but much further than this their knowledge of preparing medicines goeth not; and yet these men succeed; that is, they make money and block up the field to the exclusion of those who have through long years of tedious preparation qualified themselves thoroughly for the faithful practice of their art. One reason why these men succeed is, the facility with which they can supply themselves with all the medicines required in their business, ready made, at the hands of the manufacturing pharmaceutists. The spirit of a republican government being averse to all restriction of individual freedom in business matters, it will be difficult to devise an effectual legal remedy for this state of things, but the writer would observe, that if the law should require all those who practise pharmacy to make, themselves, the larger portion of the medicinal preparations they dispense, pharmacy would rapidly rise to its proper position amongst the scientific arts of the age.

Chicago, Ill., Dec. 6, 1859.

ON ALUMEN EXSICCATUM.

By John M. Maisch.

It is a well known fact, that potassa alum may be decomposed by the application of a high heat, so that sulphate of potassa and the sesquioxide of aluminium are left behind, from which the former may be obtained by long continued washing with water. If the heat is not carried so high, only the water of crystallization is expelled from the alum, and the anhydrous double salt is left behind, which, when in contact with cold water, slowly combines with the expelled water of crystallization and subsequently dissolves; this recombination with and dissolving in water is effected in a short time if hot water is employed.

All the Pharmacopœias of this country, as well as of Europe, direct the employment of potassa alum for the preparation of alumen exsiccatum. The directions are in most cases very nearly alike. The alum is introduced into an earthen or iron vessel, or into a dish or a crucible, and heated over the fire till it becomes dry, or till a porous spongy mass is obtained; or a constant agitation is ordered until vapors cease to be given off. The temperature is not indicated in any of the Pharmacopœias; the French Codex, however, remarks that the temperature must not be increased to a red heat.

The whole product, as obtained by this process, is allowed to be used by all the various Pharmacopœias, with the single exception of that of Greece. All who have prepared burned alum will have noticed a denser mass on the bottom of the vessel underneath that light spongy salt, which by the aqueous vapors has been puffed up from the upper portions of the fused alum. Now, this dense mass is rejected by the Greek Pharmacopœia, which allows only the spongy portion to be used, probably from the supposition that the former was partly decomposed. There can be no doubt that some care is necessary to prevent such a decomposition on that point of the vessel which is nearest to the fire; but if the heat is not carried too high, no sulphuric acid will be expelled, and repeated experiments made at different times, have satisfied me that this portion is wholly soluble in water, and is therefore alum, and not a product of partial decomposition by the influence of heat.

If burned alum is well prepared, that is, if only the water has been expelled, it is very slowly soluble in cold water, but dissolves rapidly in hot water. This is an easy test for this preparation, and might be regarded sufficient for proving its having been well made. A number of Pharmacopœias give this behaviour as the requisite test, while no test at all is given by the United States, the various British and the Swedish Pharmacopœias. The Pharmacopœia Badensis, of 1841, has the following tests: It is white, tasteless, at first not soluble in water, but dissolves after some time when left *in contact with the air.* The Prussian and the Danish Pharmacopœias allow a partially decomposed burned alum, for they state, as a test, that it is *almost* wholly soluble in water.

As far as the taste is regarded, it is true that none is observed the first moment that the burned alum is applied to the tongue; but the presence of moisture there and the heat of that organ almost immediately render a portion soluble, and the peculiar sweetish astringent taste of alum is perceptible. This behaviour is observed with all burned alum, provided that no sulphuric acid has been expelled, in which latter case the tastelessness is soon replaced by the mild saline taste peculiar to sulphate of potassa. Even alum, which by continued exposure to heat has been deprived entirely of its water of crystallization, soon imparts to the tongue this taste. Tastelessness, therefore, is no criterion for the faultless preparation of burned alum; but, on the contrary, is a sign that the heat employed has been high enough to decompose the double salt and drive off a portion of the sulphuric acid.

A mark for the same faulty preparation is a partial solubility. It is presumed that the action of burned alum consists essentially in its power to absorb a considerable proportion of water, after which its astringent powers come into play. If the alum has been exsiccated insufficiently, the former quality cannot be fully developed, and if it has been decomposed by too high a heat, the absorbing power and the astringency have been wholly or partially destroyed. The observance of a certain temperature during desiccation is, therefore, essential; but we possess no experiments which would point out to the pharmaceutist the necessary precautions to be observed. We have been so far satisfied with the statement of chemists, that potassa alum fuses when heated, and loses its water of crystallization, and that at a dull red heat also sulphuric acid is driven off from the alumina.

Of latter years potassa alum has been scarce, and commanded a high price, and ammonia alum has been substituted in commerce for the former. There can be no doubt that ammonia alum has been extensively used in the preparation of burned alum, and as no complaints have found their way into the journals, it is to be assumed with success. It is a deviation from the Pharmacopœia, and the question arises whether it is justifiable, from a pharmaceutical point of view, to substitute one for the other. We know that ammonia alum has precisely the same properties as potassa alum ; alike as they are in their physical appearance, they are also alike in their general medicinal properties ; they both lose their water of crystallization when heated, and absorb it again when brought into contact with moisture. But there is one material difference between the two alums, inasmuch as sulphate of ammonia is decomposed by heat, and ammonia alum, when heated sufficiently high, leaves pure alumina behind.

The difficulty with which potassa alum is obtained now-a-days, makes it desirable to be able to use the ammonia alum in place of it. For preparing hydrate and the various salts of alumina, it is superior to the other, because the sulphate of ammonia, being easier soluble, is more readily washed away with water than sulphate of potassa. But it remained to be ascertained what precautions are necessary for preparing burned alum from the double sulphate of ammonia and alumina. I have, therefore, undertaken some experiments with a view to finding the most suitable temperature for desiccating this alum ; and the potassa alum has been likewise employed for some experiments.

Before proceeding to the experiments, I may state here, that they have been performed in a sand bath, heated by an alcohol lamp ; the temperature in all cases applies to the sand bath ; the alum, the weight of which in each case was six drachms, was fused and desiccated in tared porcelain capsules, and in the case of ammonia alum, moistened red and blue litmus paper was kept suspended over the dish so as to notice any decomposition of the sulphate of ammonia, which at a higher heat is decomposed into water, nitrogen, ammonia and sulphite of ammonia.

1. Ammonia alum was heated to 250° ; after three hours the loss amounted to 2 drachms or 33·3 per cent. ; the product was dense and unsatisfactory.

2. Ammonia alum was heated to 350° for two hours ; the whole loss was 160 grains or 44·4 per cent. This product was likewise dense, but rather whiter than number one. If all the water had been dissipated, the loss ought to have amounted to 181·37 grs.

3. Potassa alum was fused at 250°; it soon became tough again, and the heat was therefore raised to 330°; after two hours, the residue was a coherent, dense mass, weighing, after subtracting the weight of the capsule, 3 drs. 40 grs. It was broken into pieces and heated for half an hour; its weight now was 3 drs. 37 grs.; is was rubbed to powder, and after another half hour its weight still amounted to 3 drs. 34 grs. The fire was now removed, and the capsule left over night in the sand bath; next morning its weight was ascertained to be the same as the night previous; the whole loss therefore was 146 grains, or 40·55 per cent. The product was grey, dense and not satisfactory.

4. Potassa alum was at once heated to 350°; after two hours it weighed 3 drs. 22 grs. It was now powdered and heated again for the space of one hour, when its weight was ascertained to be 3 drs. 19 grs. The whole loss therefore amounted to 161 grains or 44·72 per cent.; the product resembled the foregoing and was not fully satisfactory. If entirely anhydrous the loss ought to have been 163·36.

The last made burned alum was analyzed for its sulphuric acid; twenty grains were shaken with one ounce of distilled water; after seven hours it was not wholly dissolved yet; the solution was perfect after twenty-four hours, but it contained impurities from the alum, amounting, when filtered off, washed and dried, to one quarter of a grain; if the impurities were evenly diffused through the burned alum, they would amount to 2¼ grs. for the whole weight of 199 grs., and prove the alum to be anhydrous.

The alum solution when treated with chloride of barium, yielded a precipitate of sulphate of baryta, which, after washing and drying weighed, 34·5 grs., corresponding with 11·9 grains of SO_3. 19·75 grs. $Al_2\,O_3$, KO, $4SO_3$ would contain 12·15 grs. sulphuric acid.

The above experiments, though yielding an anhydrous alum, did not give satisfaction, on account of the product not being light enough, in which state it is generally preferred. Experiments were therefore undertaken at a higher temperature and particular attention paid to the loss. Four drachms of alum were used, and the heat of the sand bath was previously raised to

450° before the capsule was put on. Both alums now were rapidly fused, puffed up, and soon became a spongy mass; by repeated weighing the loss was ascertained. When the ammonia alum had lost 107 grs. or 44·58 per cent., and the potassa alum 106 grs. or 44·166 per cent., the dishes were removed from the fire. The lower portion of both cakes was a rather dense mass, but the greater part was of a porous and light character; the whole was white and unobjectionable in appearance.

Twenty grains of the densest part of the potassa alum was dissolved in water, and precipitated by chloride of barium; the sulphate of baryta, after washing and drying, weighed 35·5 grs., corresponding with 12·24 grs. SO_3. This part of the alum is therefore anhydrous; for 20 grs. anhydrous potassa alum contain 12·31 grs. SO_3, yielding 35·7 grs. BaO, SO_3.

The burned ammonia alum was rubbed to a fine powder; 20 grs. of the same were treated as before, to ascertain the sulphuric acid present in it; it yielded 37 grs. BaO, SO_3 which contain 12·758 grs. SO_3. Twenty grains of burned ammonia alum which has left a residue of 55·418 per cent. contains by calculation 12·713 grs. SO_3.

In neither of the above cases, therefore, has there been any sulphuric acid expelled, and it now need scarcely be mentioned that the test paper, suspended over the ammonia alum during the exsiccation, had in no instance been changed.

Crystallized potassa alum contains 45·53 per cent. of water; ammonia alum, besides that equivalent of water which is requisite for the existence of oxide of ammonium, 47·67 per cent. water of crystallization. If we therefore expose either of the two alums to a heat of 450° until they have lost from 44 to 45 per cent. of water, we obtain a beautiful light and spongy product, which contains between 1 and 5 per cent. of its weight of water; and though not entirely anhydrous, answers all the purposes for which burned alum is employed; while on the other hand there is no danger of decomposition from too high or too long continued a heat.

It may be considered unobjectionable if its solution in cold water takes place slowly, but if 6 parts of boiling water dissolve the whole of it in a short space of time.

Philad'a, Dec. 1859.

ON LIQUOR FERRI IODIDI,

AND

ON A NEW COMPOUND OF IODINE AND SUGAR.

By E. Fougera, Pharmaceutist, New York and Brooklyn.

The numberless formulas proposed every day by pharmaceutists and manufacturing chemists, are a sufficient proof of the difficulty of preserving the iodide of iron free of decomposition, and also of the non-success of the previous recipes.

In the November number of this Journal, Mr. W. C. Chapman, a gentleman who has made some researches in this favorite preparation, states that he has found no better recipe than the one published by Dr. Squibb, an eminent manufacturing chemist of our city of Brooklyn. The object of this communication is not the discussion of the merits of his article, or of Dr. Squibb's process, but to give a new and simple formula, which does away with all the cautions for filtration, and affords at the same time a beautiful light green liquor of the iodide of iron, very easy of preservation, as can be seen by the two accompanying bottles, marked Liquor Ferri Iodidi U. S.

Since 1856, I have tried, in my leisure hours, to prepare an unchangeable solution of iodide of iron, and was not a long time in finding out that the modus operandi of the U. S. Pharmacopœia was defective, nor that many other recipes published at different times were not much better, since in all of them the combination of the iodine with the iron is effected in the same manner, viz: by throwing all of the iron into the water previously mixed with the iodine. In this first step lies the difference between my formula and those in use.

Every chemist is aware that in chemical combination, a change of temperature will sometimes change the nature of a product. Such may be the case in the preparation of this ferruginous salt.

From all my experiments I have come to the conclusion:

1st. That glycerin has very little, if any, superiority over sugar, for the preservation of the ferruginous liquor.

2d. That the Liquor Ferri Iodidi freshly made, or already undergoing decomposition, becomes entirely unchangeable, by a long exposure to heat, or to the rays of the sun, even if the bottle afterward be but partly filled, and kept in a dark place. The same result is also obtained by the addition of a few drops of tincture of iodine to the ordinary liquor, and exposure to the heat and sun as above. In proof of this, I forward to you, Mr. Editor, two small bottles, which have served me in my experiments, the one labelled made October 3d, 1857, the other June 3d, 1858; both were exposed to the rays of the sun till January 4th, 1859, when they were taken into the cellar and left there ever since.

3d. That iodine forms with sugar a chemical combination, as it is explained below.

4th. That the liquor of iodide of iron is improved, and rendered more perfect by exposure to the rays of the sun.

I will here mention a formula which I have used for some time with satisfaction; it consists in introducing 4 oz. crushed sugar into a Florence flask along with the water, iodine and iron; when the salt of iron is formed, which is known, as usual, by the light green color of the liquor, it is filtered over the remaining 8 oz. of sugar, boiled and strained as any other syrup. This process of adding a part of the sugar to the first operation, has the advantage of furnishing a sweetened green solution, which can be filtered with as much ease as simple water, without fear of any decomposition.

However good the above formula may be, I have abandoned it for the following:

Liquor Ferri Iodidi U. S.

℞. Iodini sublimat. ℥ij.
Pulv. Ferri puri ʒv.
Sacchari Albi ℥xij.
Aquæ destillatæ q. s. vel. ℥xiv.
Ut fiat solutio secundum artem.

The iodine is weighed separately in a wide mouth bottle, perfectly dry; all of the iron and about 6 oz. of water, more or less, makes no difference, is introduced into an ordinary bottle, and the iodine added in small quantities (one to two drachms), adding a new portion only when the previous one is combined to the iron. As soon as a portion of iodine is thrown into the iron water, the operator is to shake the bottle continuously until the metalloid is combined with the metal; and to avoid the elevation of temperature during the chemical combination, the bottle must be shaken under a stream of cold water, or in a tub of ice water.

When all of the iodine is combined with the iron, which requires only half an hour, the light green solution is filtered, and the filter washed with a sufficient quantity of water to make the liquid measure 12 oz. fluid. To this the sugar is added, the whole raised to the boiling point, and strained. When cold, 20 oz. fluid must be completed with some water, then the liquor is put in a ℔j. or 4 oz. bottle, according to the sale. The filtration requires no more than ordinary care, no decomposition takes place, and none of the salt is left on the filter, on which remains only a small portion of the excess of the metallic iron.

The liquor thus made can be kept free of decomposition, in filled bottles, either in the light or in the dark. When the bottles are not full, if kept in the dark, the liquor, after a while, becomes slightly yellowish; but if exposed in a warm place or to the rays of the sun, its beautiful light green color is restored, and invariably maintained if kept so long enough.

When liquor ferri iodidi is undergoing decomposition, I have ascertained that the decomposition stops at a certain point, and goes no farther, even when placed in an evaporating dish, simply covered with a piece of paper, and left in the dark. Why is this?

Again, when this same preparation, with or without an excess of iodine is exposed a certain length of time to the heat or to the rays of the sun, it permanently keeps its light greenish color. Why is this also?

At present I am not fully prepared to answer these two questions, but I may take another opportunity for doing so. However, I may be allowed to say here, that the old theory of the decomposition of iodide of iron, first into protoxide of iron and iodohydric acid by the decomposition of water, and afterwards the transformation of the proto into the sesquioxide by the oxygen of the air, cannot be admitted here, except *perhaps* when the iodide of iron is in a purely aqueous solution. But granting the correctness of the theory, we would ask why decomposition does not continue indefinitely in saccharine solutions of iodide of iron, until the whole of it is decomposed into sesquioxide of iron and iodohydric acid ?

I will here state a fact, that I have no where seen mentioned, and which I can prove beyond a doubt: it is that iodine unites with sugar to form a chemical combination, which I will call *iodide of sugar.*

This new therapeutic agent, as white and as agreable to the taste as the simple syrup, stable in its composition, no doubt will some day take the lead among the preparations of iodine. This metalloid, however, has but a slight affinity for sugar ; but that they do unite together, the three accompanying bottles marked syrup of iodide of sugar will prove. These bottles contain respectively one, two and four grains of iodine to the ounce by weight.

From this fact I draw the inference, that the sugar, which is the very substance that preserves the iodide of iron intact, is also the cause of its decomposition to a certain point; and from it I deduct my theory, which is, that in the liquor ferri iodidi, the sugar by affinity decomposes a small portion of the iodine and protoxide of iron, and when this liquor is warmed or exposed to the sun's rays, the iodine combines with the sugar to form iodide of sugar, and the protoxide of iron probably combines also with the sugar, or dissolves in the syrup, so as to form a syrup of protoxide of iron.

In the other instance, when to a newly made liquor a slight excess of iodine is added, and the whole exposed to the heat as above, the sugar combines with that small portion of iodine, and its affinity for the metalloid is lessened, so much that it has no more power to decompose the iodide of iron, which will therefore remain permanent.

These two assertions prove conclusively also, that there can be no iodate of iron formed, as has been advanced by some, and that this ferruginous liquor can, and ought to be, kept in the sun's light.

[Note.—The above paper was accompanied by seven specimens ; four of syrup of iodide of iron, and three of "iodide of sugar," so called. The iodide of iron preparations were thin, syrupy, light green liquids, perfectly transparent. The vials of "iodide of sugar" were nearly colorless solutions of sugar, having an acid reaction. One of them slowly deposited a white sediment, which, when subjected to Trommer's test, with alkaline oxide of copper, proved to be glucose. The clear solutions, on testing, were also glucosic. On adding a few drops of NO^5 to the dilute syrup, it was colored straw yellow, and smelled of iodine. The syrup, diluted with water, afforded a yellow precipitate with iodide of lead, and a reddish yellow becoming red with bi-chloride of mercury.

The inference is that the iodine exists in the syrup as iodohydric acid, and not as simple iodine, as supposed by the author. When a portion of the solution was heated with sulphate of morphia, and a drop or two of SO^3, no evidence of the presence of iodic acid was obtained. As the author does not inform us how he prepared the "iodides of sugar" we cannot consider the subject from the point of view desirable. Yet it may be well, in support of the above remarks, to quote from Mr. Gordon's paper on this subject, (Proceedings Amer. Pharm. Associa., Boston, 1859, page 290,) "A solution of iodine in sugar and water, in which iodine is more soluble than water, has a dark red color; sun light changes it to white [colorless?], and no free iodine can be found in the decolorized liquid, and all the reactions show that the iodine has been changed into hydriodic acid."

But, whilst admitting this view, we ask, whence came the hydrogen of the hydriodic acid? from the sugar, or by decomposition of water? If the former, what compound other than sugar and hydriodic acid exists in the syrup? If the latter, what became of the oxygen? We have reason to believe that iodic acid is not present. Does the nascent oxygen react on the sugar to produce saccharic or oxalic acid in minute quantity? As regards the formation of glucose—that has been before observed by Maisch, and especially by Mayer, (see Proceedings Am. Pharm. Assoc., 1859, page 369,) and is due to the action of hydriodic acid just as SO^3 will do it. The brief time incident to passing this paper through the press does not admit of a solution of these questions.—EDITOR AM. JOUR. PHARM.]

WEIGHTS AND MEASURES OF THE PHARMACOPŒIA.

By EDWARD R. SQUIBB, M. D.

In the course of a few years' practice with a number of the formulæ of the Pharmacopœia, the writer has been convinced of the inconvenience of the system of weights and measures adopted for the formulæ as used in their necessary relation with the ordinary avoirdupois weights. And from some observations and enquiry into the practice of others, he is confirmed in the opinion that there are reasons of sufficient importance to justify a change. In giving due thought and attention, however, to so important a matter, the writer cannot agree with those who advocate the change about to be made by the council of British Colleges, nor with those who desire a sudden and more radical change to the French system. At the same time the numerous and great advantages of the decimal system over any other that is practicable, and the rapidity of its advances into general favor and appreciation, seem to indicate that the time is not very distant when it might be adopted with some security of its coming speedily into general use. In view of these circumstances, no intermediate change like that adopted in Great Britain would be advisable, since it is far better to suffer the present inconveniences, than involve the necessity of two changes to reach the desired object.

At the same time it appears to the writer that there is a course by which the disadvantages of the present system might be avoided, and a greater degree of accuracy attained, without the revolution which must necessarily attend the adoption of a new system.

This course is, first, to abolish measures of capacity altogether, and to define quantities by weight alone, and secondly, to substitute the term "parts," meaning parts by weight, for the troy weights, and measures in all the formulæ of the Pharmacopœia.

The principal objection to measures of capacity in an authoritative standard is the want of accuracy in practice entailed by incorrect adjustment and graduation, by differences in reading the measuring line, and by the change of volume incident to change of temperature in liquids. By weighing instead of measuring, these sources of inaccuracy are in great degree avoided, whilst simplicity and uniformity are attained, and costly fragile articles of apparatus are dispensed with, except for prescription uses. Improved accuracy and simplicity would be the main points gained, whilst in convenience and celerity of manipulation very little would be lost.

In substituting parts by weight for both weights and measures the prominent advantage would be that all kinds of weights would be equally applicable, the accuracy of the practice depending upon the ratio alone. The operator may at will translate the word parts into avoirdupois or troy pounds, or half pounds, quarter pounds, ounces, drachms, grammes, scruples, or even grains according to the quantities needed, or the system of weights he might have, and yet the result would be always the same. While it would give room, if desired, for a recommendation to purchase and use the decimal weights in view of their ultimate adoption.

If the initial number of parts in each formula be placed high enough, all troublesome fractions might be avoided ; whilst upon any scale within the intended limits of the officinal formulæ, the description and manipulation of processes would be quite applicable.

Many arguments of more or less force might be used in favor of such a change, but as they will naturally occur to those who give attention and thought to the subject, it appears unnecessary to detail them.

The strongest objections to the proposed change that the writer has been able to raise, are, first that it is a change from an already established course, and a somewhat radical change involving much labor in remodelling the formulæ, and that the sufficiency of the reasons for making a change may be doubted by some. Secondly, that it involves the necessity of weighing all liquids, including menstruæ, and thus introduces a complication of taking the tare of vessels. In view of the great degree of uncertainty, in measuring such materials as acids, however, this inconvenience would be warranted, whilst that of operating with tared vessels is more apparent than real in practice, since no one who may have applied it in making syrups, solutions, &c., will doubt the advantage in point of accuracy and uniformity of results.

There is nothing very new in such a system, since, in four European Pharmacopœias now in the writer's possession, measures of capacity are not used ; and the method of taking parts by weight, though less common, is occasionally met with in authoritative works. Wherever noticed it always brings to the writer's mind the significance of a simple and universally applicable mode of expression.

These suggestions are published with diffidence, and as suggestions only. They are not advocated or urged with any degree of pertinacity. But from having been applied in the writer's practice with supposed advantage, they are given to attract thought and attention to the subject in advance of the approaching revision of the Pharmacopœia.

As illustrative examples of such an application in practice the formulæ of the following paper are expressed in this manner.

OBSERVATIONS UPON SOME FORMULÆ AND PROCESSES FOR PREPARATIONS THAT MAY BE BROUGHT FORWARD FOR ADMISSION INTO THE PHARMACOPŒIA.

By Edward R. Squibb, M. D.

In point of importance, utility and convenience there is probably no preparation that could be introduced into the Pharmacopœia with greater advantage than a well adjusted solution of tersulphate of sesquioxide of iron.

Such a solution should always be kept in readiness for preparing the antidote to arsenic, and might with great advantage be substituted for the crystallized sulphate of protoxide, whenever that salt is used in formulæ for preparations of the sesquioxide, as for instance, in the preparation of citrate of iron, tartrate of iron and potassa, ferrocyanide of potassium, hydrated oxide of iron, and for preparations not officinal.

Liquor Ferri Tersulphatis.

Take of Sulphate of Iron,	one hundred and thirty-nine parts.
	$=FeO,SO_3+7HO$, or one equivalent.
Sulphuric Acid,	twenty-five parts.
	$=SO_3+Aq.$ or half an equivalent.
Nitric Acid,	sixteen parts.
	$=1$ part plus the equivalent quantity.
Distilled water,	a sufficient quantity.

To forty-five parts of the water, in a basin of the capacity of five hundred parts, add the sulphuric and nitric acids and heat the mixture. Then add the sulphate of iron in portions of one-tenth of the whole quantity, at short intervals, with stirring. When the whole of the salt shall have been added, boil the solution and test it for protoxide by means of solution of ferridcyanide of potassium. Should the test produce a blue instead of an olive green color in the very dilute solution, add a little more nitric acid and repeat the boiling. Finally dilute the solution to two hundred parts and filter.

The sulphuric acid should be added to the water before heating in order to avoid explosions from the rapid combination, and when the nitric acid is added, if the basin be placed over a lamp or in a water bath the heat will be sufficient to start the reaction, and the sulphate may be added rapidly. The process should be conducted under a hood or in the open air, and if the heating be brisk enough the violent reaction is finished in a very few minutes. If the nitric acid be of the officinal strength, there will not be a trace of proto salt discoverable by the test a moment after the last crystals are dissolved, and the additions of the salt in the large crystals in which it usually occurs is an advantage to the process, because the reaction is then more moderate, and less of the nitric acid is driven off undecomposed in the vapors. The boiling is directed for the purpose of driving off oxides of nitrogen, and to diminish any slight excess of nitric acid. It need not be continued beyond a few minutes, and the whole process, except the filtration, even when ounces are taken for the parts in the formula, may be completed within an hour. The filtration is very tedious, and not always necessary. It need never be applied to any but the last portions of a bottle of the solution, provided time be allowed for the insoluble matter to settle. The testing should be performed upon a single drop of the solution dropped into a test tube half filled with water, and a single drop of solution of ferridcyanide is all that it is proper to add. Great mistakes are often made in the application of delicate tests by using too large quantities.

The process is simple and easy and needs no great degree of skill for its performance, the principal point being so to keep up the heat that the effervescence progresses with the additions of the salt, and does not accumulate till near the end, and then froth over the basin. Such an accident of course vitiates the result.

The writer has used this formula upon the various scales of a quarter of a pound, an ounce and a drachm to each part of the formula and with the same convenience in all.

The resulting solution is a syrupy liquid of a dark, dull brown color, odorless, but with an acid astringent taste. It has a s. g. of 1·66, and in composition is as follows:

$$\begin{array}{rcccl}
Fe_2O_3 = & 80\times 1 & = 80 & = 20 & \text{per cent.}\left\{\begin{array}{l}\text{Fe, 14 per cent.}\\ \text{O, }\ \ 6\ \ \text{``}\end{array}\right. \\
3SO_3 = & 40\times 3 & =120 & = 30 & \text{``} \\
22{\cdot}22HO = & 9\times 22{\cdot}22 & = 200 & = 50 & \text{``} \\
\hline
\multicolumn{2}{r}{Fe_2O_3\,3SO_3 + 22{\cdot}22HO} & = 400 & =100 & \\
\hline
\end{array}$$

Its known and accurate composition when thus made, and the decimal quality of the figures which express its strength, render it very convenient in practice.

Each part of the solution is equivalent to 0·695 parts of crystallized sulphate of protoxide—or one part of crystallized sulphate of protoxide is equivalent to 1·43885 parts of the solution.

Each part of the solution is saturated by 1·275 parts of officinal liquor ammoniæ, or by ·85 part of a solution containing 15 per cent. of ammoniæ, the commercial ammonia being about this strength, or s. g. ·940.

Thus when the hydrated oxide is to be prepared from it, whether for antidote or other purposes, eight parts of the solution—say eight ounces, as about the proper quantity for the antidote, ten and a quarter ounces of liquor ammoniæ, or six and eight-tenth ounces of commercial ammonia will precipitate it perfectly. When to be used instead of the sulphate of protoxide, in such a formula as the Ferri et Potassæ Tartras, for instance, 11·51079 ounces is to be taken—or more practically, as there is an excess of sesquioxide provided by the formula—eleven and a half ounces, as the equivalent of the eight ounces of crystallized sulphate of protoxide, directed in the formula.

Another solution of sulphate of sesquioxide of iron, of different composition, has lately been employed in medicine and surgery with effects so well marked, and now so well established here, that there appears to be no doubt of the propriety of introducing it among the officinal preparations. It is the styptic and hæmostatic solution of M. Monsel, of Bordeaux. In a paper upon this preparation, by Prof. Procter, in the September number of this Journal, the questions are raised: first, as to whether the salt of Monsel's solution is a definite chemical compound, or a mixture of two salts already known; and secondly, whether it possesses any advantages over the normal salt as a remedial agent.

With regard to the first question, the writer believes this to be a new and distinct combination of the acid and base, for the two following principal reasons: Where the dilute solution is precipitated by ammonia, the ammonia being kept always in excess to avoid, as far as possible, the formation of sub-salts, an ochrey, heavy precipitate is obtained, which is almost absolutely insoluble in hydrochloric acid. Again, the reaction with concentrated sulphuric acid, pointed out by M. Monsel, is very characteristic, and, as far as the writer knows, does not belong to either of the salts already known.

Whether its remedial agency is peculiar to it as a sub-salt in contradistinction to the normal, or so-called neutral salt, the writer cannot state from either experiment or observation, but he is decidedly of the opinion that to its minus proportion of acid belongs that peculiar property or quality which renders it so very nearly innoxious and unirritating to the living tissues. He has seen it repeatedly applied, of full strength, to grave wounds without any irritant effect, and it has been repeatedly injected into varicose veins, and been quietly absorbed with the clot, without either local or general irritation.

Within the observation of the writer, in the hands of his professional friends, it has been instrumental in arresting the most difficult and troublesome hemorrhages; and has been freely used internally, as well as externally, with good results.

Dentists also find it a valuable agent in the practice of their art; and in the treatment of spongy gums, hemorrhages, &c., it appears to have taken a place hitherto vacant; and yet in the absence of direct comparative experiment, it would be impossible to assert that a solution of the normal salt would be less effective.

As the formula of the writer differs a little from those of M. Monsel and Prof. Procter, in being more simple and easy, it may be worth while to offer it for trial, adopting for this preparation the name of persulphate, in contradistinction to the normal tersulphate.

Liquor Ferri Persulphatis.

Monsel's Solution.

Take of Sulphate of Iron,	one hundred parts,
Sulphuric acid,	nine parts,
Nitric acid,	twelve parts,
Distilled water,	a sufficient quantity.

Into a tared basin, of the capacity of three hundred parts, weigh in succession, thirty parts of distilled water and the acids, place the basin over a lamp, and add the sulphate of iron. Heat the mixture to brisk ebullition, with constant stirring, and finally add distilled water until the solution weighs one hundred and fifty parts.

If the crystallized sulphate be clean and dry, and the acids be of officinal strength, the quantities given are so nearly exact that the process is easy and the result accurate. If the materials be not officinal, it should not be undertaken without close calculation of their strength.

The addition of the acids to the water in the capsule produces sufficient heat to start the reaction, and the flame of a good lamp, gas burner, or furnace then keeps up and increases the heat as the nitric acid is decomposed, so that nothing is lost by violence of reaction from too much heat at first, whilst the heating progresses as the nitric acid diminishes, so that no troublesome frothing is encountered, and by the time all the crystals are dissolved the liquid will be well heated, and the nitric acid and protoxide of iron will have finished their reaction. The slow solution of the large crystals also economizes nitric acid by controlling the violence of the reaction, while the heat is still great enough to perfect the reaction as it progresses. The subsequent boiling is intended to drive off oxides of nitrogen, and to effect this within practically useful limits it need not be long continued. The whole process should be conducted under a hood to avoid the nitrous vapors. The solution should be allowed to cool before its final adjustment, otherwise the evaporation that takes place whilst cooling would reduce the weight materially.

The resulting solution is a syrupy liquid of a deep, rich ruby or brownish ruby color, very different from the dull reddish brown of the normal solution of tersulphate. It is odorless, but has a slightly pungent and powerfully astringent rough taste, but the pungency is not of that sharp corrosive acid character that belongs to the normal solution. Its specific gravity is 1·578 by hydrometer. When treated with concentrated sulphuric acid, drop by drop, it is first partially decolorized, and then converted into a white moist solid like plaster paris in the act of setting.

In composition this solution is as follows:

$2Fe_2O_3$ =80×2	=160=19·185 p. ct.	=43·166 per ct.	$2Fe_2O_3,5SO_3$
$5SO_3$ =40×5	=200=23·981 "		
52·66 HO = 9×52·66	=474=56·834 "	=56·834 "	Water.
$2Fe_2O_3\,5SO^3$+52·66HO	=834=100	100	

This is not precisely the salt or solution of M. Monsel, because his process does not yield a salt of the composition he gives it. Taking the French Codex as authority for the specific gravity equivalent of Baumé's hydrometer scale, and taking Ure's tables as given by Wood and Bache for the strength of acids, it was determined by calculation that the process of Monsel is deficient in sulphuric acid by 9·936 per cent. to give a salt with the formula $2Fe_2\,O_3\,5SO_3$. Such a minus proportion of SO_3 in his process tends strongly to the formation of a portion of $Fe_2\,O_3$, $3NO_5$, and the writer has found in actual practice with his formula that the prescribed quantity of nitric acid, though in excess by calculation, is not sufficient to peroxidize the whole of the iron, unless the proportion of sulphuric acid be increased. This would appear to indicate that in the absence of a definite proportion of SO_3, a portion of the NO_5 combines with the excess of base, and is not decomposed by the FeO, SO_3 even on boiling. If sulphuric acid be dropped into such a solution while boiling it effervesces and liberates nitric oxide, as nitric acid would under different circumstances.

The writer has used the original process of M. Monsel, with French weights and measures, and with much care, but could not obtain by it a solution of 45° Baumé = s. g. 1·454, but always a s. g. 1·52. This latter density was also that obtained in the practice of the same process by Prof. Procter.

The writer's process above given yields the compound $2Fe_2\,O_3$, $5SO_3$, but the solution is a little more dense than that of M. Monsel, rendered stronger in getting at convenient whole numbers to express the quantity and result. The writer has used this process upon the various scales of half ounce, quarter ounce, and one drachm to each part, with convenience and advantage, and also on a scale of 33⅓ lbs. av. of sulphate, but here some modification in the management was necessary.

The late suggestion of M. Monsel, that a small proportion of linseed oil be added to the solution, and shaken with it occasionally during some days, has been tried without any notable advantage, except that when the solution is dried on plates, it renders the salt rather less obstinately adherent to the plates.

The writer has succeeded only with great trouble and loss in making the scales or hydrated solid salt described by M. Monsel, and could never obtain anything like an elegant or easily managable preparation, in consequence, first, of the sticking to the plates when dry, and next, in consequence of the deliquescent character of the salt. The anhydrous salt is easily and conveniently obtained by painting the solution quickly upon a heated iron plate. When thus managed it dries very quickly in the form of light yellow, spongy, brittle scales, resembling tannic acid. This form is also deliquescent, but much less so than the hydrated salt. In view of the character of these solid forms, it is fortunate that they are not at all important practically, since the solution fulfils all useful indications.

The remaining new preparation proposed to be noticed in this paper is the Pyrophosphate of Iron, in the combination originally proposed by M. E. Robiquet, of Paris.

In view of the chemical character and physical properties of this compound, and influenced by the statements in regard to it made by a Commission of the French Académie, the writer about a year ago, offered it to the medical profession here for trial, and subsequently brought it to the notice of the New York Academy of Medicine. From the first introduction of it here, several hundred pounds of the syrup has been used, with such effect that its value has been established here as a ferruginous tonic. Its advantages over other ferruginous tonics are, briefly, that it does not produce constipation, but commonly an opposite tendency,—that it does not excite the vascular system or produce nausea, headach or tinitus,—that it is nearly tasteless, and may be easily administered to all classes of patients,—and finally that in common with the Lactate of Iron, and the Tartrate of Iron and Potassa, it appears to be assimilated without decomposition, and consequently without impoverishing or changing the gastric secretions.

The process for its preparation involves a process for Pyrophosphate of Soda.

Sodæ Pyrophosphas.

Take of Crystallized Phosphate of Soda, sixteen parts.

Melt the salt in a porcelain capsule by means of heat, and boil it down to dryness. Collect the dry salt in a sand crucible and expose it to a cherry red heat until it fuses. Finally, when cold, break the crucible, and having collected the fused salt, powder it and keep it in a stoppered bottle. The yield is five and a half parts.

The Phosphate of Soda readily fuses or melts in its water of crystallization, and is easily evaporated to dryness over a gas flame. When nearly dry it should be stirred tp avoid loss by splashing, and render it more easily detached from the capsule. The dry phosphate from sixteen parts weighs seven and a quarter parts. The heating in the crucible to drive off the equivalent of basic water requires much care and attention, because, if the heat goes beyond cherry-redness a portion of the salt is decomposed, probably by the silica of the crucible,—the crucible is perforated, and the portion in the lower part escapes into the fire before the upper portions are fused. The writer has repeatedly lost portions of the salt in this way. Cast iron vessels, or crucibles are no better, but are even more easily burned through. The crucible should be heated slowly and with constant watchfulness, allowing plenty of time, and the salt should be pushed down in the crucible as the lower portions fuse. It does not fuse short of a full cherry-red heat. In cooling the salt contracts and becomes crystalline, so that in breaking the crucible it is not very difficult to detach it with a hammer, without disturbing the thin film that lines the crucible. This latter should not be detached, because it is partially decomposed and contaminated with the material of the crucible. The fused salt from sixteen parts weighs five and seven-eighth parts, but by rejecting that portion which is unfit for use, only five and a quarter parts are obtained. As this salt is of difficult solubility it should be kept powdered for use.

Ferri Pyrophosphas.

Take of Pyrophosphate of Soda, four parts.
Solution of Tersulphate of Iron, eight parts.
Citric Acid, two and three-fourth parts.
Solution of Ammonia, six and three-fourth parts.
Water, a sufficient quantity.

Dissolve the Pyrophosphate of Soda in sixty parts of water by means of heat, cool the solution to 50°, and filter it into a bottle of the capacity of two hundred and fifty parts. Then add the solution of Tersulphate of Iron, shake the mixture well, fill the bottle up with water, again agitate it, and set it aside for twenty-four hours to settle. Decant the clear liquid from the precipitate by means of a syphon, and repeat the washing and decantation twice. Then pour the precipitate upon a strainer, drain it for twenty-four hours, and transfer the magma to a tared porcelain basin. Upon the Citric Acid, contained in a suitable vessel, pour the solution of Ammonia, a little at a time, with constant stirring till the crystals are dissolved, and the acid accurately saturated. Then add this solution to the magma in the basin, and apply heat. Stir the mixture constantly till the magma is perfectly dissolved, and evaporate the solution to twenty-four parts and filter it through paper. Finally pour the solution upon plates, dry the salt by a moderate heat, and keep it in well closed bottles. The yield is a little more than seven and a half parts.

The anhydrous pyrophosphate of soda is so difficult of solution that even though in powder it saves time to apply heat for dissolving it. When dissolved in boiling water it readily crystallizes with ten equivalents of water of crystallization, and therefore if the crystallized salt be used in this formula six and three-fourth parts is required, because the crystals contain 40·21 per cent. of water. The solution of the anhydrous salt is always opaque in consequence of phosphates and impurities that are rendered insoluble by the heating, and it therefore requires filtering before precipitation. The proportion of the iron solution is accurately adjusted by calculation and assay, and in practice yields accurate results, without the trouble of filtering and testing to get the point of saturation. If it be deficient in quantity or strength, however, there will be a corresponding loss, because pyrophosphate of iron is soluble in solution of pyrophosphate of soda,—and if it be in great excess, there is also a reaction involving loss.

With the proportions by weight above given, there is no loss, as was determined by a careful assay of the magma. The resulting precipitate of pyro-phosphate of sesquioxide of iron, $2Fe_2 O_3, 3b PO_5$, is quite insoluble in water, and may therefore be copiously washed without loss. It is in a very finely divided state, and so light that it settles with extreme slowness, so that in twenty-four hours it still occupies one half of the washing bottle. And yet the washing by decantation, as directed, is the most speedy method, because the precipitate so clogs a strainer as to render washing in that way almost impracticable. The washing directed does not entirely free the precipitate from sulphate of soda, but sufficiently for all useful purposes. The magma when drained as directed, having been turned up from the surface of the strainer two or three times in the twenty-four hours, weighs thirty-four parts. Should any accident occur, whereby any portion of the magma is lost, as will sometimes happen, an assay of the remainder should be made by drying and heating a portion of it carefully weighed, to redness, in a platinum capsule, and calculating the true quantity of anhydrous salt, by applying the ratio of loss obtained in the assay to the whole mass. In operating on the large scale, when pounds are taken for parts, the writer always assays the magma in this way, as a matter of precaution, or control. The results obtained in this way are very accurate.

The solution of citrate of ammonia is readily made without water, in the way directed, the point of saturation being attained by means of litmus paper, and the smell of ammonia in the solution. The ammonia should not be in excess, because it decomposes the iron salt and turns the solution brown. If, by accident, much excess is given to the solution, so that it smells strongly of the ammonia, it is proper to drive off the excess by heating before the solution is added to the pyrophosphate. When the magma and solution are put together and heated with stirring, a bright clear olive green solution is speedily obtained, provided the precipitation has been effected with solutions cooled down below 60°. When precipitated at ordinary summer temperature, the precipitate is far less soluble, and when from warm solutions scarcely at all soluble, in the given proportion of citrate. When the solutions are at 50°, the writer has never had the slightest trouble, even with a somewhat smaller proportion of citrate.

The clear solution should be evaporated or boiled down,—for boiling does not injure it at all, until reduced to twenty-four parts, and then filtered through paper. This filtration is brisk enough at first, but the last portions pass very slowly, and it is best to take a new filter for the last two or three parts of solution. It should be poured out in thin layers upon the plates, and if ounces be taken for the parts of the formula, eight large dinner plates will be required for the drying. The dry salt is slightly deliquescent, and hence the direction to keep it in well closed bottles. The formula yields, by calculation, verified by assay, three and sixty-eight hundredth parts of anhydrous pyrophosphate, or if avoirdupois ounces be taken for the parts, the yield of the iron salt is 1610 grains.

The compound salt amounting to a little more than seven and a half parts, is in the form of beautiful yellowish green, or apple green granular fragments or scales looking like crystals. These are a little tough in consistence, but still break between the teeth. It is odorless, but has a pleasant acidulous, slightly saline taste,—almost tasteless. It is thoroughly and readiy soluble in water in all proportions, reproducing the bright yellowish green solution, in which solution ferrocyanide of potassium produces only a sky blue coloration, without precipitate.

In composition it is very nearly as follows :—

$2Fe_2O_3$ =	80×2	=160	=20·86	p. c.	=48·8 per cent. $2Fe_2O_3,3bPO_5$
$3bPO_5$ =	71·4×3	=214·2	=27·94	"	
$2NH_4O$ =	26×2	= 52	= 7·97	"	=34·66 per cent. $2NH_4O,Ci$
$C_{12}H_5O_{12}$ =		174	=26·69	"	
13·22 HO, =	9×13·22	=119	=16.54	"	=16·54 per cent. Water.
$2Fe_2O_3,3bPO_5+2NH_4O,Ci+HO$		=719·2	=100		100

Or, expressed approximatively and near enough for memory, the salt consists of one-half pyrophosphate of iron, and one-third citrate of ammonia, thus making the mean dose two or three grains.

Hitherto the syrup of this salt has been almost exclusively used. This is a very elegant, convenient, and, as far as observation yet goes, a very effective preparation. That first made by the writer was according to the formulæ of Prof. Procter, published in this Journal, and although by no means an elegant preparation, was still found to be very efficient, and it obtained a favor with some practitioners, which it still retains, probably from containing less citrate of ammonia. The more elegant syrup of the formula now to be given has been found to reproduce a tendency to diarrhœa in rare cases of extreme susceptibility of the mucous membrane, as, for instance, in late stages of phthisis and other similar conditions. The dark colored and turbid syrup alluded to, from its minus proportion of citrate of ammonia, probably, does not develop this tendency to the same degree, but still produces the prompt tonic effect. Its use is, however, now limited to this small proportion of cases, and in some hands only. Other practitioners, who observed this effect in the green syrup, and are not prejudiced in favor of the other, use the green in such cases in combination with some astringent.

Syrupus Ferri Pyrophosphatis.

Take of Solution of Pyrophosphate of iron, twenty four parts.
Syrup, two hundred and forty eight parts.
Mix them.

This solution of pyrophosphate is that which results from the first formula after filtration. It forms a beautiful transparent yellowish green syrup without odor, and with only just sufficient saline taste to relieve or correct the flat insipidity of the simple syrup. It is easily taken by the most delicate stomachs, and by children, and has the single disadvantage of being very liable to mould upon the surface. From pretty accurate observations it seems to possess the rather peculiar property of being altogether inert or harmless in cases which do not respond to its tonic effect. The flavoring material used in Robiquet's original syrup is omitted in the writer's process as being injudicious, because delicate stomachs and palates are clawed by constant repetition of even the most delicate aroma, whilst in cases where a flavor is required, it can be added and varied by the prescriber.

Each fluid drachm of this syrup contains one grain of anhydrous pyrophosphate of iron, or nearly two grains of the compound salt.

M. E. Robiquet, of Paris, with whom this particular method of using this most soluble and, probably, most available compound of the two popular tonics, iron and phosphorus, published so meagre and indefinite a description of his process of preparation, that those who wished to make it would have to go over the whole ground from the beginning, with much labor and experiment that he might have saved them. The effect of such publications upon those who seek practical information from them, is very much like that of a compromise between legitimate pharmacy and the quackery of proprietory medicines,—that is the preparation is made known with advantages that secure its coming into use for trial, whilst the ambiguous insufficient publication pretty effectually confines the supply to the one source, because few would take the time and trouble to work it out thoroughly.

In the foregoing formula and processes the writer has brought forward some practical illustrations of what he believes would be the great advantages in point of accuracy of manipulation, and results by dispensing with measures of capacity or volume, and substituting weights in the formula and processes of the Pharmacopœia.

The second point, namely, the substitution of parts by weight for the definite weights, is also illustrated, but not so fairly, since the inconvenience of weighing large quantities of menstrua does not occur in these instances.

Nevertheless, in view of the direction in which Pharmacy is advancing toward fluid extracts and saturated tinctures as substitutes for the old dilute preparations, and when percolation is coming into so general and effective use, these circumstances would be less felt.

In the first formula the equivalent number of the principal ingredient, namely, $Fe\ O, So_3 + 7\ HO, = 139$, is adopted as the indicator upon which the ratio is based, and on close inspection the advantage of equivalent proportion expressed in equivalent numbers will hardly fail to be apparent.

In the second formula, where the same materials are used, the number 100 is used as the initial upon which to base the ratio, and this gives certain advantages of decimal expression where fractions are involved.

The third formula starts upon a basis that admits an avoirdupois pound of sixteen ounces as an index, and the parts of this and the following formulæ may be read as avoirdupois ounces throughout, with the advantage of starting with a one pound bottle of phosphate of soda, the form in which it is usually bought.

Brooklyn, N. Y., December, 1859.

For the American Journal of Pharmacy.

GLEANINGS FROM THE GERMAN JOURNALS.

By John M. Maisch.

Impure Veratria.—R. Kiessling has observed a singular sophistication, probably accidental impurities, of commercial *veratria*, which dissolved in acids with slight effervescence and left on incineration a bluish-green fused residue, effervescing and changing to purple on being moistened with muriatic acid. A quantitative analysis established the presence of a number of inorganic bases, in the following proportions, when calculated as carbonates. 100 parts of this veratria contained

Sesquioxide of iron,	0.20833
Carbonate of lead,	0.36713
" manganium,	0.62713
" lime,	0.62500
" magnesia,	0.23436
" soda,	3.27340
	5.33535

—*Wittst. Viert. Schr.* viii. 564–567.

Strychnia in Woorara.—A. Oberdörffer, of Hamburg, obtained *woorara* from the Esmeralda Indians of the Amazon river, from the Pevas Indians of the Rio Maranon, and by Dr. Brainard, of Chicago, a specimen from the Orinoco river. By Sonnenschein's method with phosphormolybdic acid, and by Boussingault's method of precipitating the aqueous solution of the alcoholic extract with tannic acid, &c., he obtained alkaloids, which, by their reactions with chromate of potassa and sulphuric acid, and with nitric acid, established the presence of strychnia and brucia. A complete isolation was impossible on account of the small quantity of the material (Witt. Sch. viii. 568, 569.)

Professor G. C. Wittstein has in an elaborate analysis (his V. Schr. viii. 402–412,) likewise proved the presence of these two alkaloids in woorara obtained from Brazil, but was unable to get them in an entirely pure state, owing to a body of a resinous character obstinately adhering to them.

Dr. Schlosser experimented with this last woorara on living animals. His observations, published in Wittstein's V. Schr. viii. 412–415, indicate the presence of poisonous alkaloids. Paralysis, very rapid pulsation and death by asphyxia were the most prominent symptoms.

A specimen of wood of *Strychnos toxifera*, Schomb., in the Bavarian cabinet of drugs was examined by Professor Wittstein (V. Schr. viii. 415–417.) He exhausted a portion of the bark successively with ether, alcohol, water and boiling water, and found strychnia and brucia in all these liquids; no reaction on starch was obtained.

Schweizer's Cupro-ammoniacal Solution.—For the preparation of a *solution of oxide of copper in ammonia*, which has the property of dissolving cellulose without decomposition, E. Schweizer employs the basic carbonate of copper. He precipitates a solution of sulphate of copper with carbonate of soda, washes the precipitate well, dries it in a waterbath sufficiently to rub it to a powder, and adds it in a well stoppered bottle to solution of ammonia of ·945 spec. grav. Stronger and weaker solutions dissolve less of the precipitate ; the subcarbonate of copper is more soluble in ammonia than other basic copper salts, and this may be the cause of its solution being a better solvent for cotton, &c. That the pure oxide of cupro ammonium is the true solvent for cellulose, is best proven by the solvent power of the liquor obtained by digesting copper in ammonia in contact with the air ; the addition of a few drops of sal ammoniac favors the reaction very much.—*Schweiz. Zeitschr. f. Pharm.* 1859, 110.

Quantitative determination of certain Metals and Salts.—In the Jahresbericht d. Phys. Ver. zu Frankfurt a. M. (Buchner's Repert. 1859, 294–297,) Dr. Julius Lœwe publishes researches on the *quantitative determination of silver, lead, mercury, bismuth, and cadmium* in the form of sulphides. The salts, particularly the nitrates, of these metals, when pure or mixed with sesquisalts of iron, yield with sulphuretted hydrogen a precipitate which contains more or less sulphur, the presence of which hinders the calculation of the metals or their oxides from these precipitates. The author, however, succeeds in removing the sulphur by the following manipulation:—The precipitate obtained by a current of sulphuretted hydrogen is collected upon a filter which has been previously well washed with muriatic acid and water, then dried in an air bath of 105° C. (220° F.), and carefully weighed. The precipitate is washed with recently boiled distilled water until the washings cease to redden litmus paper; by means of a spritz it is then washed into a porcelain dish and slightly heated with a moderately strong solution of pure sulphite of soda. A small addition of hyposulphite of soda appears to be of no disadvantage; on the contrary, the solution of the free sulphur seems to be accelerated thereby. The sulphide, purified in this manner, is collected again on the same filter, well washed and dried at 105° C. in the air-bath. The weight of the metal or the oxide is then calculated in the usual manner.

The same journals also contain a paper by the same author on the *quantitative separation of sulphate of lead from sulphate of baryta*, the former of which is dissolved by a filtered concentrated solution of hyposulphite of soda; heated not over 20° C., (68° F.) in order to prevent the precipitation of sulphide of lead. The sulphate of baryta remains behind; the sulphate of lead may be calculated by precipitating the solution either with sulphuretted hydrogen, with an acid, or with the neutral chromate of patassa; sulphide, sulphate and chromate of lead respectively are thus obtained.

To separate *oxide of copper from oxide of iron* for analytical purposes, by means of ammonia, Dr. Julius Lœwe (see the above named journals) proceeds as follows:—The solution of their salts is precipitated by an excess of ammonia, the precipitate allowed to settle, the blue copper solution is first filtered, and the oxide of iron then collected upon the same filter. This is washed with hot water until the filtrate ceases to produce a precipitate with ferrocyanuret of potassium, and then washed back into a porcelain dish, there to be dissolved by pure muriatic acid, and again precipitated by an excess of ammonia; the precipitate is treated in the same manner as before, then dried in an air-bath and incinerated in a platinum crucible; the previously ascertained amount of ashes of the filter is subtracted from the weight of the whole residue, when the remainder shows the weight of sesquioxide of iron. The amount of copper is ascertained by evaporating from the filtrate by means of a water bath the excess of ammonia, acidulating with muriatic acid, precipitating the copper with sulphuretted hydrogen, washing and oxidizing with nitric acid so as to obtain it as oxide of copper.

Tartrate of Baryta.—Dr. A. Vogel, jun. and Dr. C. Reischauer have published in Buchner's Repertorium, 1859, 337–348, researches on *tartrate of baryta*, the results of which are as follows:—This salt exists in an amorphous and in a crystalline state; when freshly precipitated, it is flocculent and amorphous, but soon changes into the crystalline modification which rapidly subsides in heavy granular crystals. A characteristic difference between these two modifications is their solubility in water, the amorphous tartrate dissolving in 83, the crystalline in 1300 parts of water. The flocculent precipitate in solution of baryta by tartaric acid, or in chloride of barium by tartrate of potassa, may be dissolved in the requisite quantity of water, from which solution, on standing, the crystalline tartrate of baryta is separated.

Preparation of Bromide and Iodide of Potassium.—Professor Dr. A. Buchner has proposed the following formula for the second edition of the new Bavarian Pharmacopœia:—2 oz. iron filings and 18 oz. of distilled water are mixed in a flask with 3 oz. of bromine gradually added, and agitated until the liquid has assumed a greenish color, when it is filtered, and the filter washed with distilled water. This liquid is added to a solution of 1 oz.

bromine in a sufficient quantity of diluted caustic potassa; most of the iron is then precipitated with caustic potassa, and the precipitation of the heated liquid is completed by the careful addition of a solution of carbonate of potassa. After standing several hours, the precipitate is filtered, washed with distilled water, evaporated and allowed to crystallize as long as pure crystals are formed, which are to be quickly washed with a little cold water and dried.

For *iodide of potassium*, the formula is like the preceding, ex cept that for 2 oz. iron, 36 oz. water and 6 oz. iodine, and for the second solution 2 oz. iodine are employed. The author proposes, after Liebig's suggestion to dissolve, instead of one-third, one-fourth of the whole iodine or bromine employed, in the caustic potassa, in order to precipitate, not hydrated sesquioxide, but the magnetic oxide of iron, which is less voluminous, and therefore more easily washed.

On the decolorization of a solution of Indigo in sulphuric acid by volatile oils.—C. Frederking, of Riga, gives the following information in a letter to Dr. Bley, published in Archiv d. Pharm. 1859, Sept. 289, 290. The solution of indigo was decolorized by oleum aurantii, anethi, angelicæ, cassiæ, limonis, menth. pip. Amer., menthæ crispæ, lavandulæ, juniperi baccæ (commercial), sabinæ, salviæ, saturejæ Portug, terebinth. It was not decolorized by oleum anisi, caryophylli, carvi (self-prepared), bergamottæ, ceræ, calami, cajeputi, fœniculi, hyssopi, menth. pip. Germ., origani, junip. bacc. (self-prepared), petroselini, serpylli, rosmarini, petræ, thymi, valerianæ. One-tenth oil of turpentine added to oil of valerian and oil of juniper of his own preparation, decolorized the solution of indigo. It appears that some oils may be tested for turpentine in the manner indicated.*

On rectifying 12 *lbs. chloroform*, C. Frederking obtained, towards the end of the distillation, ½ oz. of a liquid of the spec. grav. of chloroform, but having the odor of valerianate of oxide of amyle; it was probably formed by the oxidation of the fusel oil of the alcohol.—*Archiv d. Ph.* 1859, *Aug.* 149.*

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* M. Frederking does not appear to have met with the observations of Dr. J. T. Plummer "*On the discolorizing properties of the essential oils,*" Amer. Jour. Phar., 1853, page 398; and also at page 408 of the same volume, in a paper entitled "*Experiments with sulph-indigotic acid and ozonous atmospheres.*" The reader will find this subject interestingly treated of in these papers six years before M. Frederking was attracted to the subject.—Ed. Am. Jour. Phar.

Oxidation by Chromic Acid.—Frederking (Arch. d. Ph. 1859, Aug. 150,) has observed, that all carbohydrates (sugar, starch, &c.) are decomposed by chromate of potassa and a sufficient quantity of sulphuric acid, into carbonic acid and water. Oxalic, tartaric, citric and other polybasic acids are likewise oxidized by this reagent; the carbon is calculated from the carbonic acid, the oxygen of which is deducted from the whole amount of oxygen given off by the chromic acid; the difference has been used for the oxidation of the hydrogen; the weight wanting on the whole substance is oxygen. Acetic, formic and monobasic acids in general yield no carbonic acid.

ON THE CRYSTALS IN THE BARK OF GUAIACUM.

By Dr. Otto Berg.

A large number of very small, colorless, and bright crystals may be observed by means of a magnifying glass, upon the inner surface of the bark of guaiacum, which therefrom receives a peculiar lustre. Guibourt declared them to be benzoic acid. Richard and Trommsdorff, however, crystallized resin of guaiacum, of which the bark contains about 2·5 per ct. In Liebig and Woehler's Handwoerterbuch, there is a paper on guaiacum by Dr. Städeler, who thinks it not improbable that the crystallized body might be the guaiacin, observed by Landerer in the sediment of a tincture of guaiacum. I have pointed out this error already in the first edition of my Pharmacognosy, where I stated that these crystals were of inorganic nature, and nothing else but gypsum. Later works, however, have repeated those old assertions, and I feel myself thereby induced to enter in this place more into details on this subject.

These crystals are found not only upon the inner surface of the bark, but are evenly distributed throughout the whole inner portion, and may therefore be readily recognized upon the thin lamellæ into which the bark may be split after a short maceration in water; each of the cells of the parenchyma, which are placed in very regular rows, contains a single crystal which occupies nearly their whole interior.

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* The same substance was noticed in chloroform by Mr. Henry Pemberton, see Amer. Jour. Phar., 1853, page 113.—Editor.

From thin longitudinal cuts, some of the crystals may be easily separated by ablution, and on rolling them about under the microscope, they are easily recognized as four-sided prisms, and as twin-crystals of the same size. The presence of these so-called swallow-tailed crystals led to the supposition of their being gypsum, and this was verified by the micro-chemical analysis.

If the crystals are heated, they assume a milk-white color, which is characteristic of the crystals of sulphate of lime. A similar change, under somewhat different conditions, may be observed, if a very thin longitudinal section of this interior bark in a tangential direction is incinerated. If it is carefully moistened with water, it will be observed that the crystals have changed their color to a milk-white, but have remained in their respective positions. Reduced to sulphide of calcium by the carbon of the cellulose, they are dissolved with effervescence on the addition of nitric acid, and the evaporated solution again yields prisms of sulphate of lime in star-like groups, but considerably smaller in size.

The same twin-crystals of gypsum are likewise found in the inner bark of other plants; for instance, in the bark of Swietenia Senegalensis, and in a somewhat different shape in the bark of Pterocarpus Massupium. The crystals of gypsum in the parenchymous cells of the various species of Musa are of various shapes, and are always found in a larger number in the cells, which are never entirely filled by them.—*Archiv d. Pharm.* 1859, *August* 155, 156.

BOTANICAL AND PHARMACOLOGICAL INQUIRIES AND DESIDERATA.*

By Sir William J. Hooker, K. H., &c.
Director of the Royal Gardens of Kew:
ASSISTED BY
Daniel Hanbury, Esq., F. L. S., &c.

Botany is a science which requires to be studied at home as well as in the field. For this reason it is highly desirable that persons visiting a foreign land should not only obtain information on the spot respecting its plants and their uses and properties, but that they should transmit to this country ample collections of *well-preserved specimens.* These may consist of *living plants* or of *pressed and dried botanical specimens* and of *fruits* and *seeds,* also of various vegetable products. By the last term we mean such objects as *medicinal substances* (barks, roots, gums, resins, and the like,) *dye-stuffs,* useful *fibres,* interesting *woods, oil-seeds,* with the oil prepared from them, *farinaceous substances,*—in fine, whatever of vegetable origin deserves attention on account of its utility to man.

Let us therefore offer in the first place a few plain instructions for collecting and transporting plants in foreign lands.

Living Plants for Cultivation.

Plants for cultivation in our European gardens may be introduced either as *seeds, bulbs, tubers, cuttings,* or *rooted plants.*

Seeds, bulbs, and *tubers* are easily collected, and as easily

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[*To promote the acquisition of information by travellers, the article "Botany," extracted from the Admiralty Manual of Scientific Inquiry, 3d edition, 1859, has been published in pamphlet form, comprising instructions for the collection and preservation of specimens, together with notes and inquiries regarding botanical materia medica subjects. A copy of this has been sent to us by Mr. Hanbury, with the request to publish such parts of it as will facilitate the object in view. There are several gentlemen in the Medical corps of the U. S. Navy, and among its officers, of whom Dr. Ruschenberger and Capt. Page are examples, who have availed themselves of the excellent opportunities sometimes afforded during the cruizing voyages of the national vessels, in prosecuting inquiries of this kind, and we hope that these inquiries will attract the attention of some of those gentlemen.—Editor Am. Jour. Pharm.]

transmitted to Europe from very distant countries. The first, *seeds*, require to be gathered quite ripe; to be wrapped, a quantity of each, in dry and not absorbent paper, done up in a parcel, and kept, if possible, while on board ship, in an airy part of the cabin. *Bulbs* and *tubers* should be taken up when the foliage has withered; and, if well dried, they may be packed in the same way as seeds.

Cuttings.—Generally speaking, it is vain to attempt sending *cuttings of plants* to a distance, for they soon perish; but this is not the case with the greater number of *succulent* plants—those with thick and firm fleshy stems and leaves. Such are many of the *Cactus tribe* in South America; the various succulents of South Africa, as *Aloes*, *Euphorbias*, *Stapelias*, *Mesembryanthemums* or *Fig-Marygolds*, the *Houseleek* kind, &c. Many of the *Bromelia*, or Pine-apple tribe, and the *Agaves* or *American Aloes*, will survive a long time as cuttings. The cuttings should be taken off, if possible, where there is a contraction or articulation of the stem, or at the setting on of a branch. The wound ought to be dried by exposure to the sun; and the cuttings may be packed in a box, with paper wrapped about them, or any dry elastic substance to keep them steady.

Rooted Plants.—Some few of these, namely, such as are of a succulent nature, small plants of *Cactus*, *Aloë*, *Bromelia*, *Tillandsia*, and *Zamia*, &c., and (which are now highly valued in European stoves) the various *Epiphytes* or *Air-plants*, those numerous *Orchideous plants* and others of the *Arum tribe*, which clothe the trunks and branches of trees in tropical countries:—all these will bear a long voyage if removed with their roots and stowed in a box, like the cuttings above described, the larger kinds surrounded with dry straw. But plants, in general, when taken up with their roots (and young ones should be preferred,) can only be securely transported, placed in earth, in Ward's plant-cases, now generally known and most deservedly esteemed: these cases are glazed at the top or roof, so as to be in fact small portable greenhouses. The plants should be established in the cases some days before sending them off, secured by splines, so as to confine the roots in the soil in the event of the box being overturned, and moderately watered. The lid is then fastened with putty and screws; and the case being placed on the deck of a vessel so as to be exposed to the light, which is an indispensable requisite, will require no watering nor any attention (unless the glass happens to be broken) during the entire voyage.

On Preserving Plants for the Herbarium.

This is by no means the difficult process which many have imagined. The object is to prepare the specimens in such a manner that their moisture may be *quickly absorbed*, the colors, so far as possible, preserved, and such a degree of pressure imparted that they may not shrivel in drying.

For these purposes provide a quantity of paper of moderate folio size and rather absorbent quality—brown or stout grey paper answers the purpose exceedingly well. An excellent kind, when not to be used in a hot and moist country, is *Bentall's botanical paper*, 16 inches by 10, which costs (folded) 15*s.* a ream; or of larger size, namely, 20 inches by 12, 21*s.* per ream. It is sold by Newman, No. 9, Devonshire Street, Bishopsgate Street, London. In a hot and moist region, brown paper may be employed with advantage. Two boards are requisite, of the same size as the paper, or a trifle larger, one for the top, the other for the bottom of the mass of papers. Some pieces of millboard placed between the specimens, if these are numerous or particularly thick and woody, are very useful. For pressure nothing is better than a heavy weight on the topmost board, or, while travelling, three leathern straps and buckles, two to bind the boards transversely, and one longitudinally. Thus provided, gather your specimens, if the plant be small, root and stem; if large, take off portions of the branches, a foot or rather more in length, always selecting those which are slender and in flower, or in a more or less advanced state of fruit. Long slender plants, as *grasses*, *sedges*, and many *ferns*, may be doubled once or twice. Place them, as quickly after being gathered as you can, side by side, but never one upon the other, on the same sheet of paper, taking care that one part of the bundle be not materially thicker than the other; and lay over the specimens one, two, three, or more sheets of paper, according to the thickness of your paper, and of your plants; and so on, layer above layer of paper and specimens, and subject the whole to pressure. In a day or two, according to the more or less succulent nature of the plants and the heat and dryness of the climate, remove into fresh papers, twice or oftener, till the moisture be absorbed, and dry the spare papers in the sun or by a fire for future use.

If the specimens cannot be laid down as soon as gathered, they should be deposited in a tin box, which indeed is essential to the botanist when travelling; there they will remain uninjured for a day and night, supposing the box to be well filled and securely closed to prevent evaporation. Some very succulent plants, and others with fine but rigid leaves—the heath and pine tribe, for example—require to be plunged for an instant into boiling water ere they are pressed. In this case the superabundant moisture must be absorbed by a cloth or by blotting-paper.

When sufficiently dry the specimens should be put into dry papers, one sheet or folio between each; except they be unusually woody (which is the case with oaks and pines,) and then more paper must be employed, care being used to distribute the specimens pretty equally over the sheets, and thus a great many may be safely stowed in a small compass. A slip of paper should be placed with each specimen, stating its name, if known, and the date and place of collection. Specimens so arranged are now ready for transport, either packed in boxes or covered with oil-cloth.

Mosses and cryptogamous plants may be generally dried in the common way: those which grow in tufts should be separated by the hand to form neat specimens. Seaweeds require a slight washing in fresh water, and common blotting-paper is the best for removing the moisture from this tribe of plants.

It is almost needless to add that *all plants*, whether living or dried, ought to be transmitted to Europe with the least possible delay; the latter, especially in hot or moist climates are often soon destroyed by the depredations of insects.

BOTANICAL AND PHARMACOLOGICAL INQUIRIES AND DESIDERATA.

AFRICA—WEST COAST, ALSO EAST COAST, INCLUDING THE RED SEA AND ARABIA.

Copal.—Information is much desired respecting the varieties of this substance which are found in commerce, and which are exported from the West Coast of Africa. Some copal is believed to be dug from the ground, but one variety at least is collected from the tree. This is the Sierra

Leone copal, and is produced by *Guibourtia copallifera*, Bennett, *Kobo* of the natives; specimens of this tree, including the ripe pods, are requested; it grows at Goderich and in other localities near Sierra Leone.

Grains of Paradise.—Although *Amomum Melegueta*, Roscoe, the plant which yields this drug, is now well known, there are some other interesting species nearly allied, with which botanists are very imperfectly acquainted. It is, therefore, desirable to procure specimens of such plants from various parts of the West Coast of Africa. These specimens should comprise the flowers and fruits, as well as the foliage. As the flowers are very delicate, it is necessary to preserve some specimens in spirit of wine or in dilute acetic acid. Some specimens of the fruits should also be preserved in the same manner. As the species often grow intermixed, and as flowers and fruits are produced at different seasons, special care is requisite to avoid confusion.

Korarima Cardamom is the name under which the late Dr. Pereira has described an Abyssinian cardamom, having the shape and size of a small fig, which is exported from Mussowah, a port at the southern end of the Red Sea. This drug, which has long been known in medicine, is perforated at the smaller end, and, when strung upon a cord, is commonly used by the Arabs and Abyssinians as beads for their *mesbehas* or rosaries. It is said to be brought to the market of Baso, in Southern Abyssinia, from Tumhé, a country situated in about 9° N. lat. and 35° E. long.

The plant for which the name *Amomum Korarima* has been proposed, is entirely unknown.

Olibanum.—The Olibanum found in European commerce is believed to be produced partly on the African coast, near Cape Gardafui, and partly on the southern coast of Arabia, whence it is shipped to Bombay.

Olibanum is also produced in India by certain species of *Boswellia*, called *Salai* or *Saleh*, one of which is *B. glabra*, Roxb., another *B. thurifera*, Colebr. It is extremely doubtful if the Olibanum, afforded in India by these trees, finds its way to Europe, but information on this point is desired.

African Olibanum is yielded by a tree called *Plösslea floribunda*, Endl. (*Boswellia*, Royle;) but as the drug varies considerably in appearance, it is highly probable that it is obtained from more than one species. The variety called *Lubân Mattee*, from its being shipped at Bunder Mattee, is, for instance, a very different drug from ordinary olibanum.

A resident at Aden may be able to gather some information upon this subject as well as upon the next.

Myrrh.—This celebrated drug is collected in great quantities by the Somali tribes on the African coast, near the southern extremity of the Red Sea, whence it is brought to Aden for shipment to Bombay.

A variety of myrrh, which is probably yielded by another species, is also produced (according to Vaughan) in a district lying forty miles to the east of Aden, to which place it is brought for sale.

A third variety, distinguished by the Arabs as *Bissa Bôl*, is also collected by the Somali tribes and sent by way of Aden to India.

It is a point of much interest to determine with accuracy the plants which afford these several sorts of myrrh, and for this end it is earnestly requested that those who have any opportunity for investigating the subject will not neglect to do so.

ASIA MINOR, PERSIA, CENTRAL ASIA.

Gum Tragacanth is produced in Asia Minor by several species of *Astragalus*, which it is desirable further to identify. Travellers and others who have the opportunity should preserve specimens of any species *seen* to yield the gum, as well as specimens of the gum itself; noting at the same time whether the latter was obtained from incision in the stem, or whether exuded spontaneously. Fine gum tragacanth is produced at Caissar (or Kaisarieh) and Yalavatz, in Asia Minor, at which places the practice of making longitudinal incisions in the stem of the shrub is adopted; the gum is also collected at Isbarta, Bourda, Angora, &c.

Gum tragacanth is frequently adulterated with another gum, which has been called *False Tragacanth*, *Hog Gum*, *Bassora Gum*, or *Gum Kutera*. At Smyrna it appears to be known as *Caraman Gum*. What is its origin? One of its properties is to swell up into an opaque mass, upon being placed in water, in which, however, it does not dissolve.

Storax.—None of the storax found in commerce in modern times is derived from *Styrax officinale*, L.; yet it is certain that this tree is capable, under favorable circumstances, of yielding a highly fragrant resin which was once much valued.

Authentic specimens of this resin, which is the original and legitimate *Storax*, are much desired. It was formerly produced in the south of Asia Minor, where the tree is still found in great abundance.

Salep.—Obtain specimens of the different plants which yield salep in Asia Minor, Persia and Cashmere, and especially of those that afford the best kinds.

What is the plant which affords the drug called *Badshah Saleb*, or Royal Salep? Where is it produced, and for what purpose is it valued? It has been exported to England from Bombay.

Sumbul Root.—Nothing definite is known respecting the botanical origin of this remarkable root, which is said to come into Europe by way of Russia. It is probably produced somewhere in Central Asia.

Assafœtida.—Although the ordinary assafœtida of commerce is doubtless the produce of *Narthex Assafœtida*, Falc., there are some varieties of the drug which, it is reasonable to conclude, are derived from other species. One of those sent from India to the Great Exhibition of 1851 was a brown pellucid gum-resin containing pieces of the stalk of the plant, and differing considerably from ordinary assafœtida.

Another variety, which has long been known, has been called *Stony*

Assafœtida, from its containing about 50 per cent. of gypsum, an addition which, in the case of so cheap a drug, it is difficult to understand.

Assafœtida is produced in Persia, and reaches Europe by way of Bombay.

Sagapenum, a gum resin resembling assafœtida, but not acquiring a pink color upon exposure to the air, and of not so strong an alliaceous odor. As it is occasionally shipped from Bombay, it is presumed that it is produced in Persia. Though it has been used in medicine for ages, its botanical origin is not ascertained; from analogy, however, we may infer that it is the produce of some large plant of the nat. order *Umbelliferæ.* Compared with assafœtida and galbanum, sagapenum is a rare and costly drug.

Galbanum.—The remarks we have made upon sagapenum apply to a great extent to the gum-resin known as *Galbanum.* Galbanum is, however, a far more abundant substance than sagapenum. It occurs in trade in two varieties, which are so distinct as to lead to the inference that they are yielded by distinct plants.

Galbanum is said to be imported into Russia in large quantities by way of Astrachan, but that which reaches England comes principally from Bombay.

Opopanax, another fœtid gum-resin, the produce, according to most authorities, of *Opopanax Chironium,* Koch, a large umbelliferous plant, native of the south of Europe, and of Asia Minor. There is no modern account of the collection of this drug, nor is its place of production ascertained.

Rhubarb.—Determine the true source of the various sorts of *medicinal* rhubarb sold at Kiachta to the Russians, and of that exported from Canton. Strange to say, we are still in the dark respecting the origin of this most valuable drug! In this and all such cases the drug should be procured by one who is an eye-witness to it being gathered, and specimens of the foliage, flowers, and fruit, carefully dried for the herbarium on the spot, should accompany it.

INDIA, SIAM, INDIAN, ARCHIPELAGO, CHINA, ETC.

Catechu.—Observe the processes by which the various kinds of *Catechu Cutch, Terra Japonica,* and *Gambir* are obtained; and if from trees, whether from others besides *Acacia Catechu, Areca Catechu,* and *Uncaria Gambir.* We wish to identify the trees with the respective extracts.

Grass Oils,—The grasses used in India for affording the fragrant essential oils, known as *Lemon-grass Oil* or *Essence of Verbena, Ginger-grass Oil, Citronelle,* &c., require investigation. What, for instance, is the source of the essential oil imported from Ceylon as *Oil of Lemon-grass?* It is considered quite distinct from *Citronelle,* which is also a production of the island.

Benzoin or *Gum Benjamin.*—Obtain complete specimens of the tree which affords this drug in Siam.

Cardamoms.—The so-called *Wild* or *Bastard Cardamom* of Siam is produced by *Amomum xanthioides,* Wallich, a plant of which *complete* and *well-preserved* specimens are requested in order that it may be described and figured.

The seeds *per se* have been imported into England, while the empty capsules are found in the drug-shops of China. Are the latter exported from Siam to China?

What is the origin of the cardamom called by the Chinese *Yang-chun-sha,* the *Hairy China Cardamom* of pharmacologists? It is said to be produced in the province of Kwang-tung, and it may be a native of Cochin China.

Nothing is known of the origin of the scitamineous fruit to which the name *Large Round China Cardamom* has been given, and which is known to the Chinese as *Tsaou-kow.* The same remark applies to the *Bitter-seeded Cardamom, Yih-che-tsze,* and *Ovoid China Cardamom, Tsaou-kwo* or *Quâleu ;* it is probable that all of them are productions of the south of China, or of Cochin China.

Cassia Bark.—Specimens are much desired of the tree which affords this bark in Java, on the Malabar coast, in the south of China, and in Cochin China. Botanical specimens should in all instances include good samples of the bark, young and old, obtained from the same tree.

Cassia Buds.—These are the immature fruits of a *Cinnamomum,* native of Cochin China, specimens of which are requested.

An inferior kind of Cassia Buds, known as *Lovengoopoo,* is found at Madras. What is the species that affords it?

Aromatic Barks of other *Laurineæ,* as *Culitlawang, Massoy, Sintoc,* are objects of commerce in the Indian Archipelago, and are but imperfectly known in Europe. The traveller should embrace the opportunity, when it occurs, of seeing the bark collected, and of obtaining authentic specimens of it, and of the tree yielding it.

Massoy Bark is produced on the west coast of New Guinea.

Galangal Root.—Endeavor to procure the plant affording this drug, which is imported from the south of China.

Elemi.—This resin is abundantly produced in the forests of the Philippines, where it often assists in giving a cheerful blaze to the fire of the traveller. It is also exported from Manilla as a drug. The tree that affords it is probably a *Canarium,* but it is desirable to have complete specimens in order to ascertain the species with exactness.

Elemi is also produced in Mexico, where it is known as *Copal;* it occurs in commerce in scraped pieces, which are semi-cylindrical, yellowish, semi-opaque, and having the usual strong and fragrant odor of Elemi. This drug is the produce of *Elaphrium elemiferum,* Royle, a tree occurring near

near Oaxaca, of which specimens are requested in order that it may be further examined and described.

There are other resins, of whose origin little is known, which have been imported from Mexico, Brazil, and other parts of tropical America as *Elemi.*

CENTRAL AND SOUTH AMERICA.

Sarsaparilla.—The species of *Smilax*, the roots of which constitute the various sorts of sarsaparilla found in commerce, are very imperfectly known. Good botanical specimens, comprising flowers, fruits, and leaves, and accompanied by the stem and roots, should be carefully preserved and transmitted to England for determination.

The so-called *Jamaica Sarsaparilla* grows near the Chiriqui Lagoon, in the state of Costa Rica, and a species very similar, if not identical with it, at Bajorque, on the Rio Magdalena, New Granada. Other sorts of sarsaparilla are produced in Mexico, Guatemala, Honduras, Brazil, &c. That of Guatemala grows in the department of Sacatepeques in that state.

Rhatany Root.—A variety of this drug has been exported of late years from Savanilla, in New Granada. Obtain specimens of the plant from which it is derived.

Malambo Bark, a highly aromatic bark, produced in New Granada. Of its origin nothing certain is known.

Balsam of Copaiva is imported from several parts of Brazil : it varies somewhat in properties, and is the produce of several species of the genus *Copaifera*. It is desirable to obtain the balsam of each species, with a specimen in flower and leaf, and, if possible, in fruit, of the tree affording it, and the name of the district where the tree grows, and its native appellation there.

Lignaloe.—The name of a remarkably aromatic wood sent to the Paris Exhibition of 1855, from the department of Vera Cruz, in Mexico. By what tree is it afforded ?

Lignum nephriticum.—This rare wood was sent to the Paris Exhibition of 1855 from Mexico. To what tree is it to be referred ?

Cinchona Bark, or *Peruvian Bark.*—This valuable drug, the only source of quinine, is derived from various species of *Cinchona* growing along the whole chain of the Andes, from New Granada to Boliva. Of these trees it may be said that good, pressed, botanical specimens of *any* species are interesting and desirable. Such specimens ought to include the flowers and fruits, and in every case to be accompanied by several pieces of the bark, young and old, stripped from the *very* tree from which the botanical specimens were gathered : all being most carefully and clearly labelled upon the spot with every particular worthy of note.

A point of considerablo interest, still to be determined, is the *proportion* of alkaloids contained in the *young* and *old* bark. For this determination two or three pounds of each sort of bark are requisite ; and for a perfectly fair experiment they ought to be collected from the same individual tree.

The attention of Englishmen residing in the countries indicated is especially requested to this by no means unimportant question.

Balsam of Peru.—The drug known under this designation is produced, not in Peru, but in Central America, in a district lying between Acajutla and Port Libertad, in the western part of the state of San Salvador, known as the *Balsam Coast.* The tree which affords it, may also be found at Ispanguasate (where it has been planted,) and near Chiquimulilla, and on the coast of Suchultepeques. Of this tree, which is the *Myrospermum Pereiræ* of Royle, good flowering specimens are much desired, as are also fresh seeds, in order that the plant may be raised in our hot-houses. The seeds should be transmitted by post, as their vitality is not long retained.

The balsam which is called *Balsamo negro,* is brought for sale to Sonsonate, previously to shipment at Acajutla.

Although the plant above mentioned is undoubtedly that which affords the balsam of Peru of commerce, yet there is reason to think that a balsam of similar character was formerly extracted from other species. Monardes (1565) states that balsam of Peru is *lighter* than water, but the balsam of modern times is *heavier.* Inquire into this. Is not balsam prepared at Chongon, near Guayaquil? Is any produced in Mexico? We have received the seeds of a *Myrospermum* from that country.

Balsam of Tolu.—Myroxylon Toluifera, H. B. K., the tree which affords this substance is very imperfectly known. It grows in New Granada, in the neighborhood of Turbaco, and especially in the high savannas near Tolu, Corozol, and the town of Tacasuan. It is also found at the mouth of the river Sinu, near El Zapote, and here and there on the banks of the Rio Magdalena, in the environs of Garapatas and Mompox.

Is it not possible to obtain at least the seeds, not to mention a supply of good botanical specimens, of this famous tree, and some account of the extraction of and trade in the balsam it affords?

ON AFRICAN TURMERIC.

By William F. Daniell, M. D., F. L. S.,

Hon. Member of the Pharmaceutical Society of Great Britain.

Among other vegetable products resorted to by the native Africans for the purposes of dyeing, are certain tubers procured from a plant apparently indigenous to West Africa. Being frequently offered for sale in the markets of Sierra Leone, my attention was engaged in 1856 to discover their source and appliances. These rhizomes, in their fresh state, were of a greyish or pale orange color externally, smooth, somewhat plump and fleshy, variable in size, and marked by a series of transverse rings ; one extremity being partly round or blunt, the other flat, having a central eschar or notch, indicating its detachment from another of maturer growth. They were usually met with under the form of slightly-curved, more or less cylindrical masses, from one to five inches in length, and about half to one and a half inches in diameter. A number of minor lateral offshoots or tubercules proceeded from most of the larger varieties, which thus often assumed a palmate conformation. Occasionally intermixed were large round tuberous roots, distinguished by similar annular wrinkles, and evidently constituting the parent stock from which the preceding ramifications had sprung. When broken, the internal surface presented a deep golden or orange tint, with a smooth, wax-like fracture. With the exception of a brighter hue, their physical characters so closely resembled those of the East Indian Turmeric, that it would be difficult to define their distinction in the absence of other specific differences, since the African drug is equally endowed with the peculiar odor and taste of the former, tinges the saliva yellow, and freely imparts its coloring principles to both spirit and water.

Laboring under the impression that these rhizomes could only have been furnished by some species of *Curcuma*, I was induced to place several in my garden, with the view of ascertaining to what particular variety they pertained. In the course of a few months the young shoots appeared, flowered, and much to my surprise, proved to belong to a beautiful *Canna*, commonly designated in colonial parlance by the name of *Indian shot.* Observing that similar plants were cultivated in the adjacent negro enclosures, I had a quantity of their roots dug up, which were found to correspond in every respect with those I planted. Specimens in leaf, flower, and fruit, were carefully preserved and transmitted to my friend Mr. Bennett of the British Museum, and by him determined to be identical with the *Canna speciosa* of Roscoe. This species does not appear to have been mentioned by botanical writers as indigenous to Western Africa, and has probably been confounded with the *Canna Orientalis*, or *Indica*, which was stated to be more or less common in Sierra Leone and other regions of the coast to the southward. Roscoe, in his work on Monandrian plants, has given a good figure and description of this production reared in the Botanic Gardens of Liverpool, from seeds brought from Africa in 1819.* Roots were subsequently received from Dr. Wallich, at Calcutta, who had discovered the same species growing in Nepaul.

During the early settlement of Sierra Leone, a great variety of useful seeds and roots were forwarded by Dr. Roxburgh from the East Indies, with the object of increasing the commercial resources of the infant colony. Suspecting this plant might thus have been introduced and subsequently naturalized by culture I instituted a series of inquiries among the old African settlers, in the hope of obtaining some satisfactory information relative to its origin. Sufficient data, however, did not exist to determine this point. Several of the negro inhabitants nevertheless asserted that it had been imported from the Slave coast, where the roots were extensively employed by the Foys and Mahes to dye grass and cotton fabrics a yellow hue. It is therefore no doubt the product to which Robertson alludes, when he observes that in Dahomey " these yellows are dyed with a root, which has the appearance of ginger. The color appears to resist acids better than some of those used in Britain."

Thonning, in his *Bescrivelse af Guineske Planter*, briefly describes a *Cannarubra* flourishing in Acquapim, and the *Curcuma longa* as cultivated by the natives in that portion of the Gold coast, but does not specify any distinct locality where the latter may be procured. Hitherto, no species of *Curcuma* has been described as indigenous to intertropical West Africa, and it seems doubtful whether it has even been introduced by European colonists; if so, the cultivated plant has since disappeared. Thonning, doubtless from a casual inspection of these tubers, may have been led to the erroneous conclusion that they pertained to the above *Curcuma*, which on inquiry would be apparently confirmed by their aboriginal appliances and other peculiarities indicating a remarkable affinity to turmeric.

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* His descriptive outline is as follows :—

Gen. Char. Anther single, attached to the margin of the petal-like filament; style erect, club shaped; stigma an obtuse scale; capsule 3-celled; seeds numerous, globose.

Spec. Char. Spike erect; upper lips of corolla in two sections, ovate, deeply bifid, claws long, narrow, lower lips narrow, linear, notched at the apex, declined towards the right; leaves broad lanceolate, strongly nerved.

Similar kind of rhizomes are produced, probably from this *Canna*, to a limited extent in the Portugese Island of St. Thomas, a small sample of which I purchased in 1850, at St. Anna de Chaves, and deposited as specimens in some of the economic museums in this country.

African turmeric is cultivated by the inhabitants of Sierra Leone, chiefly for the the rich yellow dye it yields. Grass cloths, mats, baskets, and other aboriginal manufactures are colored from a peculiar preparation of the roots, which, retaining their permanency of hue, become highly esteemed as articles of traffic. The brilliant flowering spike, large bright green leaves, and luxuriant development, render the plant one of the most conspicuous ornaments of the colonial gardens. Its inflorescence occurs in April, and, in fact, throughout the rainy months, the tubers attaining their maturity about December or January; they are then dug up and exposed to the sun, previous to their collection for the markets. The price hitherto has been merely nominal, being solely dependent on the demand. In some parts of India, this, and other species of *Cannæ*, have been considered sacred to Buddha, owing to an ancient tradition which ascribes their source to the sprinkling on the earth of a few drops of blood, from an accidental wound of his foot against a stone. Hence the seeds are occasionally used in the formation of rosaries, which constitute important adjuncts in certain religious rites and ceremonies.

The long palmate tubers become much shrivelled up by age, are marked with longitudinal wrinkles, and undergo such external alterations as lead to a considerable modification of form. Paper tinged with a decoction of the bruised root furnishes characteristic changes, precisely in accordance with those obtained from turmeric, and, in a series of brief experiments made by my friend Dr. G. O. Rees and myself, they appeared to correspond in several respects with those stated by pharmaceutical authorities. The color, however, produced from alkalies is of a deeper tint, and as a test indicates a superior sensitive action to their influences. The yellow coloring matter (Curcumin ?), on which the dyeing properties depend, may probably be procured by a similar process by which it is extracted from the different *Curcumas.* A consideration of the preceding details would lead to the supposition that this product may comprehend one, among other varieties of turmeric imported into England from the East Indies, and the subject is therefore worthy of careful investigation.—*London Pharm. Jour. Nov.* 1859.

ON ALCOHOLIC FERMENTATION.

By L. Pasteur.

When the accurate analyses of Gay-Lussac and Thenard and those of De Saussure had definitely established the composition of sugar and alcohol, it became easy to show theoretically that by mixing alcohol and carbonic acid, the composition of sugar might be reproduced. This was indicated by Gay-Lussac in a letter addressed by him to M. Clement in 1818, which concludes thus:—"If we suppose now that the products furnished by the ferment may be disregarded in relation to the alcohol and carbonic acid which are the only sensible results of fermentation, we shall find that 100 parts of sugar, 51.34 are converted into alcohol, and 48·66 into carbonic acid during fermentation." This deduction of Gay-Lussac coincided with the views promulgated twenty-five years before by Lavoisier upon alcoholic fermentation, and it removed all the doubts which sooner or later must have been raised by the inaccurate experiments of that illustrious chemist.

It was admitted, however, that experiment could not in all points confirm Gay-Lussac's theories, for Lavoisier had rightly indicated that a small portion of sugar was transformed into an organic acid, which he supposed to be acetic acid, but which has long since been identified with lactic acid.

The results of the author's experiments are at variance with the general opinions upon the products of fermentation:—

1. The acid of alcoholic fermentation is never either acetic or lactic acid.

2. Alcoholic and carbonic acid are not the only products of the splitting-up of sugar. They are always accompanied by succinic acid and glycerine. The proportion of succinic acid

varies between 5 and 7 thousandths, and that of glycerine between 25 and 36 thousandths of the weight of sugar set in fermentation.

3. The alcohol and carbonic acid do not equate with a definite weight of sugar; that is to say, the alcohol and carbonic acid are not in the proportions indicated by the theoretical equation; more carbonic acid is evolved than is required by the weight of alcohol produced.

4. More than 1 per cent. (1·2 to 1·5) of the weight of sugar is fixed upon the yeast in the form of various matters, amongst which are cellulose and fatty substances.

Thus of 100 grms. of sugar which are fermented, 5 to 6 grms. do not follow the equation of Lavoisier and Gay-Lussac; and this portion of sugar is transformed by assimilating water in such a way as to furnish in ordinary cases—

	grm.		grm.
Succinic acid, ...	0·6	to	0.7
Glycerin, ...	3·2	"	3·6
Carbonic acid, ...	0·6	"	0·7
Cellulose, fatty matters, and other products still undetermined, . . .	1·2	"	1·5
Total.	5·6	to	6·5

The remainder of the sugar appears to correspond with the whole of the alcohol and the rest of the carbonic acid, in accordance with the equations of Lavoisier and Gay-Lussac.

The question here arises whether the succinic acid and glycerin with the carbonic acid which accompanies them, may not be the results of a secondary and accidental action. This the author cannot admit, as in more than a hundred analyses of fermentations effected under the most different conditions, these products were always obtained.

In wine also he found that succinic acid and glycerine are present in considerable quantity; 1 litre of wine contains 6 to 8 grms. of glycerine, and 1 to 1·5 grm. of succinic acid. The solid residue of the evaporation of a litre of wine being from 15 to 25 grms., it will be seen that more than a third, and often more than half of the solid materials of wine have been unknown to the present day.—*Lon. Chem. Gaz. Oct.* 15, 1859, *from Comptes Rendus*, June 27, 1859.

ON THE PREPARATION OF CARYOPHYLLINE.

By Dr. Theodore W. C. Martius.

Professor of Pharmacy and Pharmacognosy in the University of Erlangen, Hon. Mem. of the Pharmaceutical Society of Great Britain, &c.

After that Baget and Lodibert had made the discovery of caryophylline in cloves, in the year 1825, it was remarkable that Bonastre should find none of this constituent in the cloves of Cayenne. As I have, upon two occasions, successfully employed this particular kind of cloves for the preparation of caryophylline, there appears ground for concluding either that I operated upon a greater quantity of material than did Bonastre, or that I adopted an entirely different process in order to obtain this hitherto rare substance.

In the preparation of oil of cloves, it is necessary, in order to obtain the largest produce, to subject the cloves to repeated distillation. In this process, however, one cannot avoid that through a too strong fire some of the contents of the still should splash over [*des Blaseninhalt überschiesst*], especially during the last distillation, when a comparatively small quantity of oil comes over. In such case, the oil is mixed to a greater or less extent with dusky, white, or brown flocks, which subside to the bottom of the vessel. If the distilled product be now placed on a filter, the watery part speedily passes through, but the oil, with its flocculent admixture, filters with extreme slowness. After several days the oil will have run through, leaving, however, both the flocculent residue and the filter strongly impregnated with it. Let the filter and its contents be now washed with cold alcohol of 33° Beck [= sp. gr. 0.839] until the latter runs off tasteless—for which Process a comparatively large quantity of alcohol is requisite. The filter should now be dried; its contents should be collected, mixed with much animal charcoal, treated with boiling alcohol (.839), and filtered hot. The clear solution upon cooling sets into a uniform white magma. This, which is caryophylline in an amorphous form, is to be transferred to a filter, allowed to drain, and then dried in the air. I have never, by this process, obtained caryophylline in the form of crystals, probably from my solutions being too much concentrated. The process is, upon the whole, simple, though costly as regards alcohol; I have applied it in the case of Bourbon and Amboyna cloves, as well as in operating upon Cayenne cloves.

The following process, however, is simpler and less expensive. It was put in practice upon some Cayenne cloves, and in fact upon a sample, 10 lbs. of which, after a fourteenth distillation, yielded only 25½ ounces of oil, while in general, from a like weight, one ought to obtain 33½ ounces.

If there be taken cloves (of any kind) which by repeated distillations with water have been as much as possible deprived of essential oil, and they be introduced with water into an alembic charged up to the neck, and a quick heat be then applied, there suddenly passes over a brown, flocculent, turbid liquid. To refer to an actual experiment; after Cayenne cloves had been distilled for the thirteenth time, and the quantity of oil obtained in the last distillation was so inconsiderable that further treatment was thought unnecessary, I rapidly subjected them four times over to the process described, thus obtaining from 38 to 40 litres of a brown distillate. The alembic was now emptied and cleansed from the exhausted materials, the brown distillate was introduced and distilled. From the first 7 litres of milky distillate that passed over, there separated 5 drachms of oil, which, however, was of weak taste, and perhaps consisted chiefly of caryophyllic acid. The distillation was continued until the solution that passed over scarcely possessed the smell or taste of cloves, and was as clear as water. On the next day, the residue remaining in the alembic having become cold, was transferred to a filter and washed with cold water until it ceased to yield any color. When dried, this mass constituted crude caryophylline—free, however, from all trace of oil of cloves. It was now transferred, with the addition of some animal charcoal, to a proper (and for such extractions peculiarly adapted) tin vessel, treated in a water-bath with boiling alcohol (·839), and the solution filtered hot. The crude caryophylline, which had separated upon cooling, and which formed with the alcohol a sort of magma, was now transferred to a filter; the spirit running from it of a yellowish brown. The filtered liquor was again thrown upon the charcoal, raised to the boiling temperature and filtered, by which, however, but little caryophylline was separated. This, however, was placed upon a filter; the alcohol that drained from it was distilled off to a few ounces, and the residue mixed with some animal charcoal and evaporated—and then treated with fresh boiling alcohol. The caryophylline thus purified, and perfectly white, weighed, when added to that previously obtained, 1 ounce and 5 drachms.

A portion of the cloves which had been submitted for the fourteenth time to the process of distillation, and had then been dried in the air, were treated in the tin vessel with boiling alcohol, and rapidly placed on a filter. The brown solution, upon cooling, deposited some caryophylline in cloudy flocks, but its quantity was inconsiderable; and when it is requisite to prepare the substance in larger quantity, the process, just described, of driving it over with water is certainly the most to be recommended, and the cheapest.

If one had to operate upon a considerable quantity of cloves, as 50 pounds or more, it would probably be the simplest way of all, after obtaining the oil, to transfer the contents of the still while yet hot to a coarse strainer, and when drained again, to boil them. The mixed decoctions might be allowed to subside for some days in large glass bottles, the clear supernatant liquor poured off from the sediment, and this latter then washed with cold water several times. Having been thrown upon a filter and dried, it might then be treated with alcohol and animal charcoal as already described.—*Lon. Pharm. Journ. Sep.* 1859, *from Wissenschaftliche Mittheilungen der physicalssche-medicinischen Societät zu Erlangen*, 1859.

MANUFACTURE OF OTTO OF ROSES.

At a meeting of the London Pharmaceutical Society, Oct. 5, 1859, the Chairman read the following extracts from a paper he had received, originating from a respectable mercantile house at Constantinople, and relating to the manufacture of otto of roses:

The distilling of otto of roses being completed, including those places lying in the centre of the Balkan mountains, we beg to submit the result in the following report:—

In order the better to arrive at the quantity of otto produced, we herewith give a list of all the places from which it is procured; the number of stills noted below we have with much trouble ascertained personally, and we can say with certainty that on the whole not more than 2 per cent. of the manufacturers have been left out.

District of Kezanlyk.

		Stills.
*†‡	Kezanlyk	62
†‡	Haemitli	54
†‡	Bäschirli	21
‡	Ascharrasaranli	1
‡	Jokarrisaranli	7
*†	Soflar Jokarki	32
†‡	Juranli	8
†	Akhbasch	22
‡	Keterrilass	4
*†	Böjük Oba	82
†‡	Kütschük Oba	42
‡	Doïmüchlär	50
†	Oktschülär	107
*†	Melemess	90
‡	Ilitschali	23
‡	Kara Jeïkli	15
*†	Meschid Sünedlër	12
*†	Tschami Sünedlër	29
*†	Kössöl-atsch	24
‡	Müghlüss	30
‡	Landra-köi	8
‡	Aschaki Soflër	4
‡	Jeïkanli	27
‡	Kischlar	12
†‡	Oklanli	31
‡	Jeni Mahaiö	2
‡	Jassë Wirason	42
‡	Kassludcha	40
‡	Tschannakschi	9
‡	Hamursus	19
†	Aeschüklar	22
†	Oruslër	12
*†	Armachan-koï	28
†‡	Karchanli	10
‡	Emischlër	14
‡	Hirsova	92
*‡	Kowanlik	26
†‡	Ketschi-tërrë	31
‡	Hass-köi	5
†‡	Jumurtschuli	19
*†	Schibbkarr	103

41 villages with 1271 stills

District of Jeni Sagra.

‡	Aeschikdschë	6
†‡	Haïn-köi	14
‡	Jun-köi	21
‡	Kiérdidsch	2
‡	Ferdidsch	11
†	Tersi Oba	3
‡	Tschumahali	1
‡	Ekistsche	1
†	Azatli	3
†	Adlar	1
‡	Tschsnakdscha	14

11 villages with 77 stills

District of Philoppopel.

		Stills.
*†	Carlova	12
*†	Karatscha-at	13
†	Isak Faki	1
†‡	Müslitchali	5
†‡	Söitschik	9
†‡	Sarö Tesmitschilë	4
†	Kotschi Oglulër	2
‡	Aschagki Baltschilĕr	3
†‡	Muslin Baltschilër	8
‡	Maghmudlar	10
†‡	Tschaylër	21
†‡	Kuri Aghadschilër	5
‡	Kalaïdschilër	3
‡	Ellëlër	1
*†	Rachmanlö	39
*†	Hadschar	66
†‡	Berrada-köi	19
*	Tokanndscha	2
‡	Kurfanli	2
†‡	Tschatall-tëpë	12
*†	Ilidscha	4
†‡	Mukerli	10
*†	Tschukurli	20
†‡	Haemitli Käpir	7
‡	Deïrmen Maghalëssi	2
†‡	Tukudscha Fabrikan	5
*†	Sëntschirli	13
†‡	Aïranli	5
†‡	Jeni-köi	7
‡	Tschanakdschilër	2
†	Kuri Haemitli	1
†‡	Kutschimarlar	18
‡	Dari Obassi	4
†‡	Bokas-köi	9
*†	Aschagki Omar Obassi	33
†‡	Kebir Omar Obassi	18
†‡	Kawassdschik	14
†‡	Përasik	24
‡	Odlu-köi	1
‡	Peruschtihsa	1
*†	Kalefër	27
‡	Kürd Bey-köi	5
†‡	Müderis	43
*†	Arablë	8
*	Adschä Kilissae	2
*	Aburlar	2
†	Ewdschilër	1
†‡	Tartarli	3
†	Jan Obassi	8
†‡	Aeschiklër	3
†‡	Kerranlër	8
*†	Tëkë	17
* ‡	Abdhul Rachmanly	41
†‡	Perassaden Derwendi	30
*†	Jan Béyliki	25
*†	Kara Sarli	14

Carried over 671 stills

* Signifies first quality. † Signifies second quality. ‡ Signifies weakest quality.

		Stills.
	Brought forward	671
*†	Terëli	41
*†	Kösserlër	46
*†	Köllerlër	18
*†	Okdschilër	10
†‡	Salih-köi	18

61 villages with 804 stills

District of Eski Sagra.

†‡	Eski Sagra	9
†‡	Kerista	6
‡	Kölla,	4
‡	Azërli	4
‡	Buklumik	2
‡	Idir Bey	7
‡	Kirk Owa	9
‡	Ismawli	2
†‡	Jeni Mahalö	9
†‡	Derbend	9
‡	Anserlër	9
‡	Baraklër	1
†‡	Ada-tëpë	15
†	Kassanka	31
‡	Sonkurlër	1
†‡	Palikli	10
‡	Pantikli	2
‡	Aeschek Sinekli	4

Carry up 134 stills

		Stills.
	Brought up	134
‡	Tëkë	3
‡	Kara Werlër.	5

20 villages with 142 stills

District of Tschirpan.

†‡	Tschatall-tepe	8
†	Kornukdschi	19
†‡	Ewitschilër	10
‡	Kalfa	2
‡	Jeni Mahlö	5
*†‡	Jeni Schar Jokarki Mahalö	91
‡	Jeni Schar Aschachki Mahalö	13
‡	Karatschi Wiran	10
†‡	Aschiolër	15
†‡	Ala Kün	31
‡	Schäkerr Buna	3

11 villages with 207 stills

Total:

Kezanlyk	41	villages	with	1271	stills
Philopoppel.	61	“	“	804	“
Tschirpan	11	“	“	207	“
Eski Sagra	20	“	“	142	“
Jeni Sagra	11	“	“	77	“

144 villages with 2501 stills

In the past year there were about 3000 stills at work in the places named. The considerable decrease in this year applies only to the districts of Philoppopel and Kezanlyk; those places, in the former district especially, lying adjacent to and in the mountains, have had hard frosts, which in some villages destroyed the whole of the crops, and in the others reduced the yield compared to that of the previous year by one-fourth to one-third; during last spring there were a great many floods in those places belonging to the district of Kezanlyk, those villages lying near the mountains suffering the most. For instance—

Kowanlyk,	worked	last year	with 95	stills,	and now	with only	26
Carlova,	“	“	25	“	“	“	12
Iladscha,	“	“	30	“	“	“	4
Jan Obassi,	“	“	25	“	“	“	8
Tartarli,	“	“	8	“	“	“	3

and many other places in like manner; in the district of Kezanlyk there are four villages which this year have not made a single metical, whilst in the previous one they delivered a pretty considerable quantity.

In the district of Jeni Sagra the rose plant has been subject to a blight, similar to that of the vine so often mentioned of late years; the same, however, has for the present only shown itself to any extent in the village of Ekistsche, where it has destroyed seven-eighths of the crop, but it is feared that it will spread in the ensuing years.

But, nevertheless, that which has been spoilt by the unfavorable circumstances above named, has been amply made up by the cold and wet weather during the distilling period; only in the last fourteen days have we had great heat with little rain.

It is calculated that on the average twelve occas of leaves yield one metical; some days in the previous year seventeen occas would only furnish one metical, but this year the average can be taken at ten to eleven occas, and cases are known to us where, on a very cold day, eight to nine occas, and even seven occas of leaves, yielded one metical.

The period for distilling lasts in each place usually 14 days, and it is reckoned that in this time one still produces about 120 meticals, but we know that in this year in many villages it may be computed at least 170 meticals; it is true that this is only the case in the villages lying in the lowlands, whilst in the mountains the result is beyond all expectation bad; the night-frosts and floods have destroyed more than the half of the rose plants, and during the distillation the want of leaves was much felt, so that, for instance at Hadschar, only about 6000 meticals were procured from 66 stills, and the like was the case in the other villages similarly situated. These places were also unfortunate in the weather during the time of distilling; the harvest is always four to six weeks later in the mountains than the lowlands, and Hadschar and Rachmanlo, for instance, have only completed their distillation two days ago. The weather was, however, the last fortnight fine and dry.

If we take all the places together, we think we are right in computing the average of this year's yield at 135 meticals of oil to every still; the total amount therefore of otto of roses produced this year would be about 338,000 meticals, whereas in the previous year it was only about 300,000 meticals. If we however, compare this with the last year as regards the qualities, a quite different result will be manifest. It is no doubt known that the mountainous districts yield a very strong and quickly congealing oil, whilst the villages, the lower they are situate, produce an oil so much the weaker, and only with very cold water either to be slowly congealed, or not at all. Last year those places situated in the mountains delivered about 70,000 meticals 1st strong otto of roses, and about 50,000 meticals of 2d quality; the lowlands gave about 60,000 meticals 2d, and about 120,000 meticals 3d quality; this year, on the contrary, one can only reckon to receive from the mountainous districts about 30,000 meticals 1st, and 40,000 2d; and from the lowlands, on the other hand, about 105,000 meticals 2d, and about 163,000 meticals 3d quality.

The decrease this year in 1st strong quality will hardly be noticed in Europe, as this description, with few exceptions, is not yet known there; the dealers here prefer buying the strongest quality, as it can bear a strong mixture of 3d quality, and even of geranium oil, and yet congeal pretty well. That which is known in Europe as 1st quality passes here for 2d.

They mostly sprinkle the leaves before distilling with geranium oil; these sorts of spurious oils we found at Kezanlyk, Kössöl-atsch, Müghlüss, Akhbasch, Schibbkarr, &c.; at Carlova, Rachmanlö, Böjuk Oba, the manufacturers offered us oils, which, on examination, we found to contain not only geranium oil, but also cetaceum.—*London Pharm. Journ., Nov.*, 1859.

ON CELLULOSE AND THE COMPOSITION OF WOOD.

A highly important discussion has been recently carried on in the French Academy, involving some valuable investigations into the chemical nature and composition of the proximate principles of vegetable tissues. The discovery by M. Schweitzer of the solubility of cellulose in cuprate of ammonia, first suggested the means of further inquiry into the nature of the material of which the vegetable cells are constructed. It was early ascertained by M. Cramer, M. Payen, and others, that, while this cupric solution immediately dissolved the cellular tissue of cotton and many other substances, it exerted no action upon the cellular membranes of several algæ, champignons, the pith of trees, cork, &c.

M. Payen, in a paper on the analogies and points of distinction between cellulose and starch, accounted for this difference by attributing it to the protecting action of the intercellular matter, the incrustations of mineral, fatty, and nitrogenous substances, and the presence of the epidermis. He found, if all these foreign substances were removed, and the cellulose left in a state of purity, it was immediately dissolved; and that when again precipitated by acids, it had all the properties and the composition of ordinary cellulose.

M. Fremy, in a paper on the composition of vegetable cells, showed, by means of the new reagent, that the inner walls of the cells of fruits, &c., consist, not of cellulose, but of a substance which he named *Pectose*, and which, under comparatively slight influences, and during the ripening of the fruit, is rendered soluble and converted into *Pectine*. In the course of this paper M. Fremy expressed an opinion that cellulose exists in several isomeric conditions, in one of which it is soluble in cuprate of ammonia, while in the other it is insoluble. This view, opposed to M. Payen's, was more fully developed in a subsequent communication, entitled "Distinctive Characters of Ligneous Fibres, Cortical Fibres, and the Cellular Tissue which constitutes the Pith of Trees." Up to that time the utricular tissues and vegetable fibres were considered to be formed essentially of the same substance, cellulose. M. Fremy argued, while the cupro-ammoniacal reagent immediately dissolves the cortical fibres of all plants and the utricular tissues of fruits, but exerts no action upon the pith of trees, it is difficult to consider these tissues as being formed of the same substance—the difference cannot be attributed to unequal penetration by the reagent, because the pith is much more porous than the mass of cortical fibres; the impurity of the insoluble body cannot explain the difference in action either, because the pith, properly selected, presents all the characters of a pure immediate principle, containing but inappreciable quantities of mineral substances. These chemical characters, therefore, establish a striking difference between the cellular tissue of pith and cortical fibres. The wood or fibrous tissues is also insoluble, when purified as far as possible from incrusting substances, and also even when examined in the young condition. It therefore appears that the ligneous fibres are quite distinct from the cortical fibres, the latter being soluble in cuprate of ammonia, while the former are insoluble. That this distinction cannot be accounted for by the greater hardness of the woody tissue may be inferred from the fact, that the cupro-ammoniacal liquor is capable of readily dissolving the albumen of the *Phytelephas*, or vegetable ivory, which presents much greater hardness and less porosity than the ligneous fibres. M. Fremy sought to ascertain what the conditions are by which the insoluble tissues may be rendered soluble. He found that rice paper, which is insoluble in the reagent, when submitted to the action of diluted mineral acids, is converted into a membrane which is soluble; alkalies also effect the same result, but more slowly. Acetic acid, even boiling, is incapable of producing any change. The ligneous fibres and pith are thus modified and converted into the soluble condition; the tissue of champignons, however, withstand the action of acids, and remain insoluble. From these facts M. Fremy concluded that M. Payen, in his endeavor to perfectly purify the tissues, employed agents which were capable of modifying the principle itself.

M. Payen has also brought forward several experiments tending to support his own view, and contends that there are not sufficient grounds for considering that the insolubility of certain membranes in the cupric reagent is due to the existence of several isomeric conditions of cellulose. He states that in all cases the cellulose, when freed perfectly from foreign matters, is soluble in the reagent, and that the means employed in the purification are not sufficient to effect any isomeric modification. The cellular tissue of pith, he states, although containing no incrusting substance, is nevertheless impregnated with certain bases, principally lime, which exist partly in combination with silica and partly with the organic matter. These are so uniformly distributed, that after the complete incineration of the organic matter a white skeleton remains, consisting principally of carbonate of lime, of which the weight amounts to 6-100ths of the dried pith, and which, examined under the microscope, still retain the form of the tissue. The cells of the pith are, in fact, formed of cellulose, freed from organic incrustations, but their interior walls are coated with a thin layer of nitrogenous matter containing traces of fat and foreign bodies, which oppose the penetration and solvent action of the cupric reagent. To remove these impurities, the pith was cut into slices and immersed in the copper solution, by which the cells were colored and swollen, but not dissolved. The slices were then removed, and immersed in cold water, acidulated with hydrochloric acid, which slowly dissolved the lime, &c.; they were then washed with pure water, and upon again treating with the cuprate of ammonia they readily dissolved.

M. Fremy considers that in these experiments of M. Payen, the action of the hydrochloric acid and the means employed to remove the impurities are sufficient to effect a modification of the insoluble cellulose. He points out, that tissue as dense as vegetable ivory, or impure as the ordinary cortical fibres, is readily attacked by the cupric solution. He has also shown that the tissue of pith may be rendered soluble by simply exposing it to a temperature of 150° cent., or by boiling it in water for twenty-four hours, in both of which cases the mineral matter remains unaffected, the organic substance alone undergoing alteration. The tissue, thus modified and rendered soluble, furnishes upon calcination the same amount of inorganic matter, which retains the original form of the tissue, as the original and insoluble pith.

M. Payen again brings forward the following experiments: —In order to destroy the obstacles to solution which might result from the want of contact and wetting, owing to the interposition of air, the pith was submitted to a simple grinding in cold water, by which means 45-100ths of the total weight was rendered soluble; this proportion was further increased to 75-100ths by previously drying the tissue at 110° cent. in a vacuum. In another case, the pith was immersed in water, and maintained in a vacuum for some time; the tissue, thus gorged with liquid, was then frozen: when afterwards thawed, and agitated with the reagent, it immediately commenced to dissolve.

In this way 56 per cent. of the tissue was brought into solution: the insoluble portion contained 15.5 per cent. of inorganic matter. The insoluble part in this experiment, and in the preceding, was washed with ammoniacal water, to remove as far as possible the oxide of copper. In a third experiment, the pith was simply cut into extremely thin laminæ, not exceeding from one to three millimetres in thickness, and agitated in the copper solution. In the course of an hour it commenced to dissolve, and 51 per cent. of the tissue was obtained in solution. M. Payen is prepared to admit that very great differences exist between different kinds of cellular tissue, and that the properties of the cellulose will constantly vary with the age, the thickness of the cell walls, the amount and the kind of incrusting matter, and the associated inorganic constituents ; but that difference in the action of a single solvent, such as cuprate of ammonia, is totally insufficient to establish the existence of a distinct, although isomeric, species of cellulose.

M. Fremy, in his memoir on the composition of wood, instead of assuming, as physiologists have hitherto done, that the various tissues of the plant are on a basis of cellulose, which is variously associated and impregnated with foreign substances, considers that each tissue presents a particular chemical composition, and special properties depending in some manner on the peculiar physiological part which it supports in vegetation. He has already shown that the vegetable tissues contain a principle, *Pectose* (which has not been disputed), and which has been confounded with cellulose in microscopic observations. His analyses and examination of the *cuticle* also indicate that it possesses a distinct and peculiar composition. In this paper M. Fremy only recognizes under the name of *cellulose* that substance which is immediately dissolved by cuprate of ammonia, and which constitutes cotton, cortical fibres, or the perisperm of the *Phytelephas*. The substance which constitutes the pith of trees, and which is insoluble in the copper solution, he names *Para-cellulose*. Knowing that experiments made upon a mixture of different organic tissues might lead to grave errors, M. Fremy sought to isolate the different organs of which wood is constituted, and submit them to separate examination. Botanists consider wood as formed of fibro-vascular bundles, separated one from the other with cellular tissue, divided by rays running from the pith to the centre. In certain parts of this ligneous mass are found masses of fibre unrolled and annular or punctated vessels.

To obtain the ligneous vessels in a state of purity, entirely free from fibrous or utricular substance, the wood was treated first with dilute potash, which removed the tannin, albuminous and pectic matters. It was then submitted to the action of hydrochloric acid, commencing with dilute, and gradually changing it for stronger, until the fuming acid was employed. By this means the utricular tissue was partly dissolved, and the ligneous fibres rendered soluble in the cupric reagent. In the last place, this tissue is treated with cold concentrated sulphuric acid, then washed with water, alcohol, and ether. In this way the ligneous vessels are obtained perfectly pure. The substance of which these vessels are formed M. Fremy distinguishes by the name of *vasculose.* It is characterized by its insolubility in hydrochloric acid, concentrated of sulphuric acid, and cuprate of ammonia. It is dissolved, on the contrary, by potash, concentrated and boiling.

The utricular substance, which forms the medullary rays, is identical with the pith. It is, like it, insoluble in the cupric reagent, but rendered soluble by the action of acids, of alkalies, or of heat. It consists of *Para-cellulose.* The concentrated and boiling potash, which dissolves the ligneous vessels, can also dissolve the medullary rays; this solubility affords the means of isolating the third organ of the woody tissue: the ligneous fibres. Chippings of wood are treated in a glass flask with potash sufficiently strong and hot to effect the disorganisation of the wood. It is important not to go beyond that point, as the ligneous fibres themselves may be altered. The insoluble portion is afterwards removed, and washed with water, alcohol and ether. It consists of ligneous fibres, perfectly white and in a state of purity. Oak and deal were the woods employed by M. Fremy. The substance forming these ligneous fibres is named *Fibrose;* it is characterized by its insolubility in the alkaline solution, which dissolves the vessels and the medullary rays; by its solubility in sulphuric acid, which does not dissolve the ligneous vessels; by its insolubility in the cupric reagent, which immediately dissolves the cellulose, but does not attack the ligneous fibres until they are modified by chemical agents. Fibrose and cellulose may be also distinguished by the action of sulphuric acid, which immediately dissolves cellulose, converting it into dextrine, which is not reprecipitated by water. Fibrose submitted to the action of strong sulphuric acid, dissolves like cellulose, but, on immediately adding water to the acid solution, it is reprecipitated in the form of a thick transparent jelly.—*Lon. Pharm. Jour. Oct.* 1859.

ON THE ODORS OF PERFUMES.

On occasion of the discussion which we have just recorded, M. Chevreul offered his ideas upon the mode of action of odoriferous substances. This discussion was intended to recall the publications which this distinguished chemist has made during the past thirty years—researches made specially to trace odors to their material causes. He reviews in the following manner the action by which bodies exert their odors when properly mixed with other odoriferous materials. 1st. Bodies themselves odorant disguise the odors of other substances, as a strong light overpowers a feeble one. 2d. Bodies being themselves odoriferous act in the manner of an acid in neutralizing a base. 3d. Solid bodies may act by capillary affinity to absorb odors, as is the case for example with charcoal. 4th. Other bodies act by altering the constitution of the odorant substance, producing new compounds either odorless or nearly so. Such is the action of moist chlorine or oxygenated water. 5th. Lastly, the action may be two-fold, as in the case of chlorine and ammonia, decomposing one portion and neutralizing the other without decomposition.

Neutralization includes the largest class of cases; thus the volatile odorous acids are neutralized by alkalies to form odorless salts. Ammonia loses its odor when united to an acid. The odors in such cases are truly neutralized, since displacing the acids liberates again the odors each in its own character. Examples of the destruction of odors are numerous and well known to chemists. Sulphydric acid, for instance, is at once decomposed by chlorine and consequently disinfected. Ammonia by the action of chlorine offers an example of both neutralization and destruction of odors, because at the same time we have decomposition of one part of the base and the neutralization of another part by the chlorohydric acid formed.

M. Chevreul proposes to define odors by means of a scale, analogous to our notation of sounds, or for gradations of color by the chromatic diagram (which last device we also owe to this *savant*). The great obstacle to this plan is the difficulty of employing the sense of smell as we employ that of sight or hearing, a difficulty much increased by the toleration which the smell soon acquires to odors—becoming '*blase.*'

In 1830 he endeavored to take account of the changing odors exhaled by the woad vats during evaporation, if possible to define exactly the kind of color appropriate to each condition of the vat. He reached no positive results, although he detected in the dye stuff bath *five* perfectly distinct odors; the odor of ammonia, a sulphurous odor, a metallic odor, an aromatic odor, clinging for many months to the wooden stuffs which had passed through the woad vat, and lastly, the odor of a volatile acid analogous to that of animal matters in decomposition. M. Chevreul hoped to detect in these odors of the dye vats symptoms to guide the dyer in his art, as the physician finds new indications in his knowledge of symptoms depending on the chemical nature of organic solids and liquids, if these symptoms can be certainly recognized by their odor. Thus he did not shrink from exposing himself to the most repulsive odors of the organism to reach his results. Having often heard the odor of a cancer spoken of as characteristic he examined it and recognized it to be a compound of—1st, an ammoniacal odor turning blue a reddened test paper. 2d, a feeble butyric odor. 3d, a heavy odor which is familiar in the 'trying out' of suet or lard. No specific odor exists then in cancers, since the three odors recognized coexist in *non-cancerous* matters which the disease alters. He recognized these matters in the odor of pus and other products of animal origin, and he also detected in them a sulphurous odor and a smell of fish, due probably to a compound ammonia.

To all these odors he adds what he calls the stale-nauseous (*fade nauseabonde*) which appears in well-water that has stood some days in a vessel in which have been placed egg shells impregnated with albumen.

[We may be permitted to add to these interesting facts some others which we submit to the distinguished author of the chromatic circle and researches on the fatty bodies.

1. If an odorous substance can be neutralized or destroyed by another odorant body there are others destitute of odor which by union produce odorant substances.

(To this class of odorless bodies belong O, S, Se, Te, C, H, As, Az, and we might add P, which is odorless unless combined.)

2. Likewise there are odorless bodies which have become odorant by union with others endowed with odor.

It is thus with oxalic, malic, butyric, racemic, citric, sorbic (the acid recently discovered by Hoffmann), boric, silicic acids, all odorless, which however produce with the elements of alcohol ethers more or less aromatic.

3. It is necessary to distinguish those bodies which act mechanically on the olfactory membranes (e. g., ClH, FlH, BrH, IH, and the vapors of NO_3+HO, SO_3HO) from those which exert a physiological influence (for example, Cl, Br, I, NO_4, SO_2, the hydrocarbons, the essential oils, &c.)

4. It is necessary also to distinguish bodies having an odor proper, that is, an odor which exists when they form compounds with other bodies (for example, arsenic). The arsenical odor is recognized in AsH^3, $AsBr^3$, and in the cacodyl series. Tin is another example. The odor of tin characterizes a large number of stannic compounds. Sulphur: thus SO_2SH, S_2C, SNH_3, SCl, &c., are distinguished by a more or less sulphurous odor.

We might also mention napthaline, benzoin, and other hydrocarbons and organic radicals.

We see that this group of bodies, characterized by a peculiar odor, embraces those elements which, like sulphur, arsenic and phosphorus, are destitute of odor, that is, their odor is manifest only in combination. If we examine those phenomena we observe (*a*) that elementary bodies are usually destitute of odor; (*b*) that in general the least odorant compounds are oxygen compounds; (*c*) highly odorant compounds are usually those containing hydrogen. These seemingly singular facts may to a certain extent be explained when we remember that in general chemical compounds become less volatile as they fix oxygen, while by union with hydrogen they become more volatile. But these considerations do not explain all; they do not tell us why CO and CO_2 are odorless gases, while $C_{12}H$, $C_{26}H_8$, $C_{12}H_6$, &c., &c., are odorant.

Moreover the perfumes properly so called, as musk and the aromatic essences, rose, lemon, orange, bergamot, lavender, &c. are eminently hydrogen compounds. They are not all volatile, and some of them may be exposed to the air for years, exhaling odor all the time, with no sensible loss of weight. Among these are perfumes isolated by Milon in 1856.* The cause of odors is not referable exclusively to the phenomena of volatility, although as a general thing the odor of most bodies is developed when they are volatilized.

Hydrogen must be considered, par excellence, the exciting cause of odors. This element possesses above all other substances the peculiar property of developing odors even with odorless bodies, as N, C, Se, Te, P, &c., and a great number of compounds, of these and other elements.

Oxygen, on the other hand, appears to act the chief part in the perception of odors; it seems indeed proved that odors are not recognizable where there is not oxygen in the air to bathe the olfactory membranes.]—*Am. Jour. Sci. and Arts, Nov.* 1859.

ON GALLIC AND GALLHUMIC (METAGALLIC) ACID.

By Dr. F. Mahla, Ph.D., Chicago.

It is mentioned among the reactions of gallic acid in almost every handbook of chemistry, that its solution produces a deep bluish-black color with a solution of the salts of the sesquioxyd of iron, which disappears when the solution is heated. As I have nowhere found an explanation of this fact, I have tried to investigate it by some experiments.

When the solutions of the sesquioxyd of iron and gallic acid are used in a diluted state, the resulting mixture appears only slightly colored; but if they are concentrated, it assumes, after being heated to ebullition, a dark brown tint, and then causes black spots on the skin, which can be washed away only with the greatest difficulty. Such a solution might perhaps be used advantageously as a hair dye.

If the iron-solution was not 'added in too large proportion, liquid ammonia no longer precipitates hydrated sesquioxyd of iron, but the proto-sesquioxyd (black oxyd). A reduction takes place, therefore, the oxygen transforming some of the carbon of the gallic acid into carbonic acid, which is freely evolved during the ebullition.

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*This Journal, July, 1856, p. 109.

To a portion of gallic acid, dissolved in water and heated to ebullition, a solution of sesquichlorid of iron was carefully added in small quantities and the mixture heated again after each addition. This treatment was continued, until a drop of the solution mixed with a little water ceased to give the characteristic bluish-black precipitate of gallic acid with sesquichlorid of iron. A solution of carbonate of soda was then added in slight excess and the black precipitate separated by filtration. A portion of the filtered dark-brown liquor, after being exactly saturated with hydrochloric acid, deposited a voluminous black precipitate, which, if dried, formed a black shining mass, but when freshly precipitated, was easily redissolved by free muriatic acid. Such a solution, containing but little free muriatic acid, produced black insoluble precipitates with limewater, with the different salts of lime and baryta, with sulphate of zinc and sulphate of copper. Another portion of the filtered liquor super-saturated with acetic acid, caused precipitates of a black color in solutions of acetate of lead and nitrate of silver. From the silver precipitate, metallic silver was soon separated.

The lead precipitate was carefully washed with distilled water, and after being dried in an air-bath at a temperature not exceeding 200° F. (94° C.) for ten hours, it was heated over a spirit lamp, until the organic matter was perfectly destroyed. The residue, consisting of a mixture of oxyd of lead and metallic lead, was treated with acetic acid, and from it the whole quantity of oxyd of lead was calculated.

1·052 gram. gave 0·662 of the mixture of $PbO+Pb$, which left after being treated with acetic acid 0·037 metallic lead, a quantity corresponding to 0·041 oxyd of lead. The acetic acid extracted 0·625 oxyd of lead, which quantity added to the above found 0·041, gives 0·666. This is equal to 63·30 per cent.

Gallhumic (metagallic) acid, which was detected by Pelouze in the residue of distillation, when gallic acid was suddenly heated to 480° F. (249° C.) shows the same reactions, and its lead salt, $2PbO, C^{12}H^{3}O^{3}$, contains 63·04 per cent of the oxyd of lead. No doubt can therefore exist about the identity of Pelouze's acid and my product. The equivalents of gallic acid are divided exactly into one equiv. of gallhumic, two equiv. of carbonic acid, and three equiv. of water:

$$C^{14}H^{6}O^{10} = \left\{ \begin{array}{l} C^{12}H^{3}O^{3} \\ C^{2} \quad O^{4} \\ \quad H^{3}O^{3} \\ \overline{C^{14}H^{6}O^{10}} \end{array} \right.$$

This origin of gallhumic acid forms another and interesting argument, that pyro-acids can be obtained otherwise than by the action of heat.

If some powdered "red precipitate" is added to a solution of gallic acid and heated over a spirit lamp, it is immediately reduced; gallic acid precipitates suboxyd of copper (red oxyd) in a solution of sulphate of copper; this reaction appears with the greatest facility if the solutions are heated together. It also reduces a cold solution of neutral chromate of potassa, producing the green sesquioxyd. The gallic acid is in each of these cases transformed into gallhumic acid. The action of these substances on gallic acid and the formation of the new product, is explained by assuming gallhumic acid to be only an intermediate product, the final result being carbonic acid and water.—*Am. Jour. of Sci. and Arts, Nov.* 1859.

ON THE DETERMINATION OF GRAPE-SUGAR, CANE-SUGAR AND DEXTRINE IN THEIR MIXTURES.

By J. G. Gentele.

The analysis of a mixture containing grape-sugar, cane-sugar, and dextrine, or only two of these substances, is founded upon the following facts:—

1. A mixture of 1 part of ferridcyanide of postassium (the red prussiate) with half a part of hydrate of potash, dissolved in water, *has no action upon a pure solution of cane-sugar*, either at ordinary temperatures or when heated to boiling. An extraordinarily small quantity of this reagent *gives the fluid a strong yellow color*, and this color is persistent.

2. The same reagent applied to a solution of *grape-sugar loses*

its color very slowly in the cold, more rapidly between 122° and 140° F., but very rapidly between 140° and 176° F.

If a few drops of the solution of this reagent be poured into a solution of grape-sugar, heated to 140° F., and then well shaken, the yellow color first produced very soon disappears (at 176° F. almost instantaneously). When the coloration is reproduced by the addition of a further portion of the reagent, it always disappears again as long as grape-sugar is present. Towards the end, the decolorization takes place more slowly, and is then facilitated by heating the fluid to 176° F. If the fluid retains its color at this temperature, all the grape-sugar is destroyed.

The reagent is remarkably sensitive; the yellow color which persists at last in consequence of the addition of an excess of the reagent, may be removed by a few drops of grape-sugar.

3. *Dextrine*, prepared by roasting starch, *has no action* upon this reagent, even when it has been treated with muriatic acid under the same circumstances in which cane-sugar is converted into grape-sugar.

4. If a solution of cane-sugar in 40 times its weight of water, to which 55 per cent. of the weight of the sugar of concentrated muriatic acid has been added, be heated in the water-bath to 129°—131° F., all the cane-sugar is converted into grape-sugar. If this solution be then neutralized with carbonate of soda (an excess of which has no influence), it behaves like a solution of pure grape-sugar.

In order to apply these facts to the determination of grape-sugar, cane-sugar, and dextrine in their mixtures, it was first to be ascertained what quantity of ferridcyanide of potassium is necessary to decompose a certain weight of grape-sugar. Three experiments with a normal solution of ferridcyanide of potassium, proved that on an average it required 10,980 milligrms of the reagent for the decomposition of 1000 milligrms. of cane-sugar which had been converted into grape-sugar by means of muriatic acid, or 10,980 grms. of the salt to 1 grm. of cane-sugar.

A test-fluid was then prepared containing in 100 cubic centims. 10,980 grms. of ferridcyanide of postassium and 5½ grms.

of hydrate of potash. On the other hand, 1 grm. of sugar was dissolved in 40 cubic centims. of water, and 250 milligrms. of concentrated muriatic acid were added thereto; the mixture was then heated on the water-bath for ten minutes to 129°—131° F. This solution was then neutralized with carbonate of soda, and gradually mixed with the test-fluid; of this 99·7 cubic centims. were decolorized, so that the sugar contained 99·7 per cent. of cane-sugar. By the optical test, the same sugar gave an amount of 99·75 per cent. of cane-sugar.

Thus the reagent proved to be very accurate. Towards the close of the operation, indeed, a slight yellowish color made its appearance in consequence of the formation of a concertrated solution of ferrocyanide of potassium, but this is easily distinguished from that produced by $\frac{1}{10}$th cubic centim. of the test-fluid. This coloration is scarcely perceptible when the sugar is dissolved in double the above quantity of water; and also in tests which required a smaller addition of the test-fluid.

To examine a *mixture of cane-sugar and grape-sugar*, exactly 1 grm. of it is to be weighed off and dissolved in 40 cubic centims. of water; the solution is heated to 158° F., and then $\frac{1}{10}$th cubic centim. of the test-fluid is added from a graduated tube. If the color disappears immediately (as with the syrups), a considerable quantity of grape-sugar is present, and entire cubic centimetres may then be added, until the color slowly disappears at 158° F., when the addition of tenths of cubic centimetres is recommenced. If the color produced by the last addition does not disappear in 15—20 seconds when shaken, the operation is completed, and the amount of sugar is then read off directly, the portion of the test-fluid which was not decolorized being deducted. From the cane-sugar indicated, the grape-sugar is calculated in centesimal parts x according to the equation

$$171 : 180 = n \text{ cubic centimeters} : x.$$

If the decolorization does not take place from the commencement (as with refined sugars), no grape-sugar is present; if it takes place slowly (as with raw sugar), only a small quantity of grape-sugar is present, and the testing must then be carried on very carefully, as already described for the completion of the operation.

On the other hand, in order to determine the cane-sugar contained in the mixture, 1 grm. of the same sample is weighed off and dissolved in 40 cubic centims. of water; 250 milligrms. of concentrated muriatic acid are then added, and the mixture is heated in the water-bath for ten minutes to 129°—131° F.; when it has been neutralized with carbonate of soda, it is tested in the manner previously described. The per-centage of sugar is now found to be much greater than before, the cane-sugar being converted into grape-sugar. If the number of cubic centimetres of the test-fluid employed in the preceding test be deducted from the number now found, the difference gives the centesimal amount of cane-sugar.

The author found by experiments with mixtures of solutions of cane-sugar and grape-sugar, the amount of sugar contained in each being known, that they may be determined by the described process within $\frac{1}{10}$th per cent. Of the organic acids which may occur in syrups, he only found two which, even when combined with potash, are decomposed by the test-fluid, and therefore decolorize it like sugar,—these are oxalic and tartaric acids; on the other hand, citric acid, succinic acid, and acetic acid have no action on the test-fluid.

This method of determining cane-sugar and grape-sugar evidently rests upon the same principal as Fehling's test for sugar; if the latter be arranged so as to correspond with that described by the author, it gives a larger amount of grape-sugar when dextrine is present; and the difference between the results of the two tests is to be ascribed to dextrine, so that it becomes possible to distinguish the cane-sugar, grape-sugar, and dextrine in a mixture by a volumetric process.—*London Chem. Gas. from Dingler's Polytechn. Journal*, clii. p. 68.

GLYCEROLE OF ALOES.

By A. F. Haselden.

This preparation was originally introduced by M. Chausit, and subsequently by the General Apothecaries' Company, to the notice of the profession. Thinking it possible and probable that some of the readers of the *Pharmaceutical Journal* might meet with or be questioned concerning it, without having any certain or definite acquaintance with it, I beg to offer the following brief account. Glycerole of Aloes, according to M. Chausit, is prepared by dissolving an alcoholic extract of aloes in glycerine. Upon this information, I have prepared some according to the following forms; the proportions are my own, not having any given with account of the preparation :—

Take of Socotrine Aloes, coarsely powd. and free from dirt,	ʒiv.
Rectified Spirit of wine,	℥iv.

Macerate until the aloes is dissolved, then filter through bibulous paper; distil the spirit as closely as may be, evaporate what remains to the consistence of treacle, and whilst still warm add sufficient pure glycerine to make four fluid ounces. Now, as the whole of the aloes, with the exception of a very small quantity of extraneous matter, was dissolved by the spirit and eventually mixed with the glycerine, reasoning from what I had already experienced with regard to the solvent power of that substance, I thought that it would possibly *alone* accomplish all that had already been done—that is, the solution of the aloes—but without the assistance of the spirit, and thus avoid a certain waste of material, loss of time, and needless labor. I therefore tried the following experiment:—

Take of Socotrine Aloes, in fine powder,	ʒiv.
Pure Glycerine,	℥iv.

Mix them well in a mortar, then transfer to a bottle; agitate occasionally during several days, when, should the whole of the aloes not be dissolved, digest for fifteen minutes with gentle heat by means of a water-bath, when it will become dissolved, and may now be strained through linen to separate any small portions of dirt which may by any possibility be present. The result will be a preparation exactly similar to the preceding one, minus a very small quantity of spirit. Following either of these forms, only employing a larger proportion of aloes, a very similar article may be produced from the resin of aloes, which is obtained as a useless residue in preparing the aqueous extract of aloes. This glycerole of aloes is a bright mahogany-colored liquid, of the consistence of Price's best and pure glycerine, and has been recommended by M. Chausit in the treatment of *lichen agrius* as an external application, also to the excoriations from *eczema.* It should be applied with a camel's hair brush.—*London Pharm. Journ. Dec.* 1859.

ON THE ARTIFICIAL FORMATION OF TARTARIC ACID.

By Professor Liebig.

Professor Liebig has lately made the very interesting observation that tartaric acid is among the products of decomposition of sugar of milk by nitric acid. On examining the acid mother liquid, after the separation of mucic acid, he found among other constituents an organic acid, some of the salts of which, when analyzed, yielded results differing materially from the salts of the same bases with mucic acid, but agreed with the composition of the corresponding tartrates. A comparison between the latter and the salts obtained from the mother liquor, and the further examination of the isolated acid, proved the identity of this acid with tartaric acid. But besides the true tartaric acid, the mother liquor appears to contain another acid of the same composition, but somewhat different properties, probably a modification of tartaric acid. Professor Liebig is still occupied with the researches on this subject, and expects to be able soon to report his results.

To this preliminary notice it must be added that Professor Liebig tested the sugar of milk which he used, for tartaric acid, so as to remove all suspicion of the sugar having been accidentally contaminated with the acid.

This discovery of Liebig's is very interesting, as it appears to be the first observation of the artificial formation of tartaric acid. Professor Erdmann of Leipzig, in 1836, while studying the products of decomposition of sugar by nitric acid, for the purpose of investigating Gucrin's hydroxalic acid, obtained an acid which, in accordance with his analyses, he took to be a modification of tartaric (metatartaric) acid, and which, as he observed, was spontaneously converted into tartaric acid. (Annalen d. Pharm. xxxvi. 1.) Subsequently, however, on investigating the same subject, H. Hess, of St. Petersburg, came to a different result, and declared Erdmann's metatartaric acid to be saccharic acid, (Ann. d. Ph. xxxvi. 1.) The artificial formation of tartaric acid has therefore been doubtful until Liebig's latest discovery.—*Buchner's N. Repertorium*, viii. 317, 318.

J. M. M.

ON THE EXPLOSION OF HYPOPHOSPHITE OF SODA.

By TROMMSDORFF.

Under the heading of "Caution," Dr. L. C. Marquart (*Arch. d. Ph.* lxxxv. 284,) describes a violent explosion of the above salt, while its solution was being evaporated in a porcelain capsule, placed in a heated sand-bath, for which reason too high a heat was assigned as the cause of explosion. It was, therefore, thought necessary to avoid evaporating such a solution, either over the fire or in a sand-bath, but to employ altogether a water-bath for its evaporation. This operation has been carried on very frequently, in my laboratory, without the occurrence of the least accident. But last spring, I experienced, by a painful accident, that even the low temperature of boiling water is no safeguard against explosions of this salt.

The neutral solution of hypophosphite of soda was evaporated in small portions in a porcelain dish, heated by a simple water-bath, the concentrated liquid being constantly stirred with a glass rod or a porcelain spatula. The last portion had become nearly dry, when a violent explosion took place, breaking all the windows of the laboratory, and seriously lacerating the face of the attending workman. Being near at hand, and supposing the explosion to have been caused by the neglect of the water-bath, I hurried to the spot, but found the bath filled with boiling water, and was unable to discover the least suspicious circumstance from which the cause of the accident might have been explained.

The preparation which I am using now, is of French manufacture, and has a strong alkaline reaction. Should it, in this state, be less subject to explosions? It would be highly interesting to hear of the experience of the French and other chemists, with regard to this new medicinal salt, which they are preparing in enormous quantities.

Archiv d. Pharm. 1859, *Sept.* 388. J. M. M.

ON THE PURIFICATION OF SULPHURIC ACID FROM ARSENIC.

By C. Frederking, of Riga.

The statement which appeared in the Journals last year, that sulphuric acid may be entirely purified by heating it with chloride of sodium, recommends a process, apparently very easy, but which cannot be carried out in practice.

Sulphuric acid, when brought in contact with common salt or sal ammoniac, evolves much muriatic acid gas; one drachm of chloride of ammonium was therefore introduced into a small retort, together with 15 grs. arsenious acid and half oz. water, to which three oz. suphuric acid were gradually added; muriatic acid gas was evolved, but not in very large quantity. Heat was now applied, and each half ounce of the distillate was tested for arsenic in Marsh's apparatus. The following was the result:

1st. The first half-ounce contained so much arsenic, that a metallic mirror was separated on the introduction of a zinc rod into the distillate.

2d. The second half-ounce contained yet chlorine and arsenic.

3d. The third and fourth half-ounces contained both in small proportion.

4th. The fifth half-ounce was free of chloride, and contained a minute quantity of arsenic.

5th. The residue of sulphuric acid, about one third of the original weight, held much arsenic in solution.

This behaviour may be explained in this way, that an excess of sulphuric acid prevents the formation of chloride of arsenic; it may even be easily proven, that the latter compound, when treated with concentrated sulphuric acid, is decomposed into muriatic and arsenious acids, the latter of which remains behind on distillation.

It is worth mentioning that I obtained English oil of vitriol (not the rectified) from a manufacturer of Moscow, which was free of arsenic, nitrous acid and lead, and left a residue consisting of the sulphate of potassa and of earthy matter.

In the "Archiv" for September, 1858, Neese proposes the distillation of sulphuric acid from a retort bedded in ashes; I can recommend this precaution from my own observations, inasmuch as I have been rectifying the acid in the manner indicated for the last twelve years.—*Archiv d. Pharm. Aug.* 1859.

Editorial Department.

Our Journal—This number commences the thirty-second volume of our Journal—the eighth of the third series; and it is with pleasure that we congratulate our readers on the large proportion and variety of original communications it offers for their acceptance. It is the wish of the editor to make its pages the recipient of original observations from all sections of the country. It is almost impossible to practise Pharmacy without observing something new, but comparatively few take the trouble to record their experience for the benefit of others. Our Pharmacopœia is about to be submitted to a new revision this year, by a committee to be appointed in May, 1860, by the convention at Washington. Every new fact bearing on the subject should be brought forward in time to influence their action, and we shall be glad to receive communications of that character. Will not our Southern friends give us some comments on their experience in regard to the permanence (or keeping) of syrups, fluid extracts, ointments, and other preparations liable to change by the heat of their southern latitudes, and what precautionary measures they find necessary in regard to them.

The Chicago College of Pharmacy.—We have received in pamphlet form the "Constitution and By-laws, and list of officers and members of the Chicago College of Pharmacy," organized and incorporated May 5th, 1859. It was our intention to have noticed the establishment of this institution in our last number, but by accident omitted to do so. Now we are not only able to do this, but through the above pamphlet to speak from authority. We have also met with Dr. Scammon, the President of the College, and Professor of Pharmacy in the institution, who visited this city, and from whom we learn the earnest character of the effort of our Chicago brethren. That an association should be formed there, is no matter of wonder, but that within the short space of three months an institution should be founded, and a school of Pharmacy opened, under the direction of three professors, is certainly strong evidence of the energy and spirit of the members, who according to the pamphlet number forty-one. The Officers of the College are, F. Scammon, *President;* F. A. Bryan, *Vice-President;* J. D. Paine, *Secretary*, S. S. Bliss, *Treasurer;* with a Board of ten Trustees, having four standing committees.

The faculty consists of James V. Z. Blaney, M. D., Professor of Chemistry; F. Scammon, M. D., Professor of Pharmacy; John H. Rauch, M. D., Professor of Materia Medica. The lectures commenced November 9th, and continue three evenings in the week, for twenty weeks. Matriculation fee

$2; Professors fees $6 each; Diploma fee $5. The terms of graduation are the same as those of the Philadelphia College of Pharmacy. We understand that a fair beginning has been made, and the effort has our warmest sympathy for its entire success. We would suggest to our Chicago friends to ground their prospects for the future mainly on the fact that their efforts *deserve* success, because they are *necessary and right,* and not because present enthusiasm burns brightly. There may come a period when this will cool with many, and it will need a few earnest united laborers to carry forward the College through such a discouraging season. Let them be prepared for this, and they will the sooner become firmly established.

Poisoning by Sulphate of Morphia.—It is with painful regret that we feel called upon to chronicle a case of poisoning by the accidental substitution of Sulphate of Morphia for Sulphate of Quinia, in a prescription for the latter substance, dispensed at the store of one of our most accomplished apothecaries, by which an estimable lady met an untimely death. It was alleged in the testimony before the Coroner's jury, that the prescription was for twenty-four grains of Sulphate of Quinia, in eight pills; that it was received at the store by the chief clerk, who, having read it, and being busily engaged himself, requested an apprentice to weigh the quantity of Quinia: that the apprentice took the Morphia bottle by mistake, although it was distinctly labelled (and checked by the word "poison,") and weighed out the narcotic, which in this manner came to be dispensed. These are the simple facts of the case. The clerk delegating the business of weighing the Quinia was amply qualified as regards knowledge, and a graduate in Pharmacy; the person executing that request had been a year in the store, and *a priori* would be presumed to be competent to perform so simple a service. But whether he erred from *absence of mind* or *carelessness,* or from *misunderstanding the order,* his unfitness for the task was proved by the result. Enough has been said to prove how vulnerable are the best regulated stores to the occurrence of accidents, and to demonstrate that nothing but sleepless vigilance on the part of disciplined and responsible persons can guard against these distressing events.

It is proper to reiterate on this occasion three simple rules, that if habitually followed would go far to guard against such errors in prescriptions.

1*st. Whoever engages in dispensing a prescription, let him place the recipe before him, and concentrate his faculties upon it until it is clearly understood.*

2*d. Let him never remove a substance from a bottle without reading the label upon it, and feeling satisfied that it indicates the medicine intended by the prescriber.**

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* As there are so many synonyms for medicines, and physicians vary so often from the officinal names of the Pharmacopœia, the shop bottle and the prescription often disagree in the letter.

3d. Let the mental process of recognizing the contents, as being in accordance with the label, become intuitive by practice, and never omitted.

But whilst we realize the terrible effects of this accident in its relation to the sufferer and her friends, and increase our watchfulness lest it should, in a new phase, occur to some of us; let us not forget the sympathy which is due to the apothecary, who, wounded in his reputation and business, and his keen sensibilities harrowed by the untimely, and too often ungenerous remarks of the unthinking public, finds the nine hundred and ninety-nine instances of careful and highly responsible service have been forgotten, if the thousandth falls short.

Proceedings of the American Pharmaceutical Association at the Eighth Annual Meeting held in Boston, Massachusetts, Sept. 1859; *with the Constitution and Roll of Members.* Boston. Press of Geo. C. Rand and Avery, 1859. Pp. 406, octavo.

It is with no small degree of pleasure that we receive the "Proceedings," after a somewhat unusual delay in their issue, arising out of the want of punctuality of members in returning their MSS. to the Executive Committee. In number of pages it falls considerably short of the volume for 1858, but this arises from the fact that the last 150 pages which include the special reports and volunteer papers, are printed in small type, each page of which is equal to two of the usual type. In its typography this volume compares favorably with all that have preceded it, and the paper is excellent. So much for the physique of the volume. As regards its contents much may be said. In a prefatory note, the Executive Committee go into an explanation of the cause of delay, and suggest a remedy, for the benefit of future publishing committees, in the following resolution:

"*Resolved,* That the Executive Committee receive from the hands of the Secretary on the last day of the session, all papers and manuscripts, with the minutes of the meeting, referred to them for publication, said manuscripts to be fairly and legibly written, and in proper state to be given to the printers; all manuscripts and papers not so delivered to be excluded from the printed report, unless delay be granted by a special vote of the Association."

This resolution, if passed at the next meeting, would be too late for the papers presented at that meeting, all of which will be prepared before it convenes: and as to the Secretary's minutes, they cannot be *properly* made out from sitting to sitting, and are much more likely to be correct if they are carefully examined and copied after the meeting, especially in reference to the accuracy of names, Nevertheless, we approve of its suggestion, and believe that it will induce the contributors to the meeting for 1860 to give more care in the preparation of their manuscripts.

Forty-eight pages are occupied with the minutes of the meeting as furnished by the Recording Secretary which include the President's address, the Executive Committee's report, and the list of subjects for future investigation. The Report on the Progress of Pharmacy occupies sixty six pages, and consists chiefly of succinct notes of discoveries and improvements in chemistry, materia medica, pharmacy, etc., with references to authorities, etc., which will prove useful to investigators. This paper would have been much more accessible if the committee had appended an alphabetital index to the work like that in the volume for 1858.

The Report on Weights and Measures, by Alfred B. Taylor, is the most elaborate document yet published by the Association, and is calculated to excite considerable interest beyond the precincts of the Association, from the wide scope of its researches and the novelty of its suggestions. Deeply impressed with the grave importance that attaches to any change in national customs so deeply seated as are those connected with weights and measures, the author has hesitated in urging any present change, especially as the substitutes for our present system, which have been brought forward, possess objections that render them far from perfect, including the French decimal system. The proposed alterations of the troy grain to suit the new division of the avoirdupois ounce, as adopted by the present revisers of the British Pharmacopœia, does not meet with approval, the sacrifice being greater than the benefits. The report enters into historical details of great interest, indicative of much research and thought, in reference to the various arithmetical scales that have been proposed, and especially that of the Hindoos, or our decimal system, attributed commonly to the Arabs. At this point the report takes the bold step of suggesting the adoption of the Octonary scale of enumeration with an entirely new set of characters; 8 taking the place of 10, 64 of 100, and 512 of 1000, etc. The eight primary numbers or digits he calls *un*, *du*, *the*, *fo*, *pa*, *se* and *ki*; *unty is* 8, *under* 64, *untyder* 512, *unsen* 4096, *untysen* 32768, *undersen* 262144, *untydersen* 2097152, *unkaly* or the eighth power of eight, equal to 16,777216 and so on. This octaval method is carried out in all the tables of calculation and value for weight, measures, time, length, capacity, area, etc., and in the opinion of the author presents advantages in the simplification and facilitation of calculations of the highest value to commerce and science, and worthy the effort required and inconveniences occasioned, to substitute it for the present decimal system.

The author assumes the equatorial circumference of the earth to be a more accurate and reliable basis of calculation than the meridian as adopted in the decimal system, and he has taken the *unkaly* part of the sextant of that circumference which amounts to 15⅔ inches as the unit of linear measure and calls it a *module*. The content of a cubic module is adopted as the bushel or *modius* which is the standard of measures of capacity. This measure will contain 139 pounds, and 104.7 grs. of distilled water at 39¼ Fahr. We give below the two tables of weights, and measures of capacity.

Table of capacity measure.

	Minim.	
8 minims	make	1 morsel.
8 morsels	"	1 ligule.
8 ligules	"	1 cup.
8 cups	"	1 gill.
8 gills	"	1 pint.
8 pints	"	1 gallon.
8 gallons	"	1 *modius.*
8 modiuses	"	1 butt.
8 butts	"	1 cord.
8 cords	"	1 vat.

Table of weights.

				grs.
	1 mite,	=		0.464
8 mites	1 grain.	=		3.712
8 grains	1 scrap, or ℈,	=		29.696
8 scraps	1 dram,	=	Av. ½ oz. &	18.824
8 drams	1 ounce,	=	4 "	150.595
8 ounces	1 libra or ℔,	=	2 ℔ 2 "	329.760
8 libras	1 stone,	=	17 " 6 "	13.080
8 stones	1 *pondus* or wt.	=	139 " 0 "	104.700
8 pond's.	1 load,	=	1112 " 1 "	400.000
8 loads	1 ton,	=	8896 " 15 "	138.
8 tons	1 keel,	=	71175 " 10 "	220.

We must here leave the report, and whilst granting the superior advantages arising in practice from an *octaval* enumeration, we look upon the views of the report as involving changes so radical as to wholly prevent their adoption in practice. We suggest to our readers to recur to the subject as presented in full in the Proceedings of the Association and give it a careful perusal.

The Report on the Revision of the Pharmacopœia is not the document that should have issued from the Association just prior to the decennial revision. It is not positive and definite enough, and does not come with that authority which should characterize the action of the second annual committee of a national body; nevertheless it contains many valuable suggestions, and we recommend it to the attention of the revising committees.

The Report on Home Adulterations has been already given in full to our readers in the November number; as also the special report on Fluid Extracts which follows it.

Of the other special reports and papers, the more important are,

Dr. Battey's report on Sorghum saccharatum.

J. M. Maisch on the active principle of Cornus Florida.

J. M. Maisch on the behaviour of essential oils to iodine and bromine.

Dr. Squibb on the officinal preparations of metallic mercury.

F. F. Mayer on iodide of iron, and the tests for iodine.

Dr. W. H. Pile on the specific gravity of water at different temperatures.

Henry A. Tilden on the therapeutic value of foreign and indigenous medicinal plants. The last is a paper worthy of the attention of pharmaceutists, and chemists. The first part is directed to the influence of culture on the composition of Belladonna, Hyoscyamus, Aconite, Conium and Digitalis, taken in connection with the use of ordinary manure, guano, nitrate of potassa, and nitrate of soda. The analyses in connection with the experiments on culture are sufficiently definite as regards the inorganic constituents; but in relation to the alkaloids, nothing can be learned from them, inasmuch as the "alkaline substance" was not pure, as much as 20 to 25 per cent. of it being obtained from the plant. As the whole value of the experiments depended on the accurate isolation of these active principles, they fail to convey the information sought by the author.

The conclusion of the paper consists of an outline of a plan of proximate analysis followed by tabular statements of the quantitative analysis of twenty-six drugs, chiefly of our native plants, which must have involved a large amount of labor to the chemist who executed them ; unaccompanied as they are by the details of the several analyses, and with a description of the active principles, it is difficult to form a correct opinion of their merit for accuracy.

We give a transcript of the composition of mandrake.

Mandrake root (Podophyllum peltatum.)

	Collected in April.	Collected in October.
Organic matter,	90.857	90.857
Inorganic matter,	9.143	9.143
	100.000	100.000
Gum and Albumen,	8.857	6.854
Starch,	6.057	8.121
Extractive matter,	7.571	3.897
Bitter principle,	11.828	10.882
Resin, soluble in alcohol and ether,	2.857	5.117
Resin soluble in alcohol, insoluble in ether,	2.400	0.571
Soluble salts,	1.072	2.490
Insoluble salts,	8.070	6.652
Lignin, &c.,	51.288	55.416

The points which deserve attention in this analysis, are—1st, the existence of a large amount of "bitter principle." 2d, the greater development of the resin soluble in ether in the autumn, and the diminution of that insoluble in ether at the same period. This will account for some of the discrepancies of writers on this subject. What the bitter principle is we have no means of determining from the analysis.

The Appendix to the Proceedings consists of correspondence furnished by the U. S. Patent Office, in relation to cinchona bark, and some indigenous medical productions of the Indian Territory, followed by the constitution and list of members.

In concluding this notice, we would suggest to members of the Association, in order to assist the executive committee in their financial matters, that they not only pay up all their dues, but that such as feel able should buy several copies of the Proceedings and dispose of them to pharmaceutists who are not members, and thus create an interest in the Association beyond its precincts. The price of the work is only $1.00 per copy, or $1.25 postage paid. Five dollars will therefore procure four copies by post, or five copies by a private medium.

COLLEGE OF
44 GERRARD ST. E
TORONTO

CATALOGUE OF THE CLASS OF THE PHILADELPHIA COLLEGE OF PHARMACY.

FOR THE THIRTY-NINTH SESSION, 1859-60.

With a List of their Preceptors and Localities.

Matriculants.	Town or County.	State.	Preceptor.
Abernerthy, J. M.		New Jersey,	Wm. Hodgson, Jr.
Allen, Wm. M.	Philadelphia,	Pennsylvania,	Jenks & Ogden.
Archibald, H. C.	“	“	Wm. R. Warner.
Baker, Samuel J.	“	“	Russell & Schott.
Bartram, J. J.	“	“	A. W. Parsons.
Bell, W. D.	Hagerstown,	Maryland,	O. S. Hubbell.
Bennett, W. A.	Lewisburg,	Pennsylvania.	John McFee.
Bernheimer, Joseph	Philadelphia,	“	Wm. R. Warner.
Blomer, George D.	“	“	Wm. M. Reilly.
Bolton, Joseph P.	Germantown,	“	Wm. H. Squire, M. D.
Bowman, A. H.	St. Georges,	Delaware.	A. S. Leidy.
Boyd, John W.	Cleveland,	Ohio,	Wm. Taylor.
Brown, Albert P.	Philadelphia,	Pennsylvania.	Wm. B. Webb.
Brown, F. Jr.	“	“	F. Brown.
Browne, James A.	“	“	Jno. M. Maris & Co,
Bryan, John E.	“	“	J. C. Dawes,
Bullock, Thomas H.	“	“	T. S. Wiegand.
Carbonell, F. B.		Cuba.	
Claypoole, John	Wilmington,	Delaware.	R. S. Christiani.
Coles, John W.		New Jersey.	Alfred Tatem.
Collom, Charles	Washington,	District of Columbia.	Wetherill & Bro.
Colman, Francis A.	Montreal,	Canada.	A. H. Yarnall.
Coombs, Robert D.	Philadelphia,	Pennsylvania.	Bullock & Crenshaw.
Cooper, Wm. H.	Greensboro,	Maryland	James L. Bispham.
Cowell, C. M.	Currituck,	North Carolina.	Thomas Lancaster.
Creecy, W. Pryor,	Vicksburg,	Mississippi.	E. Parrish.
Cressler, Charles H.	Chambersburg,	Pennsylvania.	Wm. Heyser, Jr.
Davis, G. H.	Philadelphia,	“	D. L. Weckerly.
Diehl, C. L.	Chicago,	Illinois,	J. R. Angney, M. D.
Dunton, Isaac	Philadelphia,	Pennsylvania.	W. W. & H. Smith.
Ellinger, Charles S.	Newton,	“	Andrew J. Gayley.
Engleman, Clemens	Philadelphia,	“	Thomas Weaver.
Enos, T. H. K.	Hagerstown,	Maryland.	O, R. Livermore.
Farr, W. W.	Philadelphia.	Pennsylvania	John C. Baker.
Fischer, Theophilus	“	“	J. P. Fitler, M. D.
Franklin, Thomas	“	“	Joseph Webb.
Fritsch, Herman		Prussia.	Dr. Genth.
Fronefield, Charles Jr.	Philadelphia,	Pennsylvania.	Miller, Fronefield & Co.
Gegan, James J.	“	“	John Gegan, M. D.
Giffard, Wm. H,	Tuckerton,	New Jersey.	Roger Keys, M. D.
Haehnlen, Jacob F. Jr.	Philadelphia,	Pennsylvania.	A. Jones.
Halpin, W. J.	“	“	Geo. D. Wetherill & Co.
Hansell, George	Rancocas,	New Jersey.	French & Richards.
Harrison, Wm. D.	London,	England.	Blair and Wyeth.
Hayes, G. E.	Athens,	Georgia.	R. M. Smith.
Hedges, Thomas J.	Philadelphia,	Pennsylvania.	J. N. Marks.
Hohl, August	Detroit,	Michigan.	Emilius Herwig.
Huff, Edmund J.	Philadelphia,	Pennsylvania.	T. M. Perot.
Huffnagle, Alfred	“	“	Samuel Filbert.
Inge, R. S. Jr.	Tuscaloosa,	Alabama,	J. T. Williams.
Jacobs, Henry H.	Philadelphia,	Pennsylvania,	Wetherill & Brother.
Jordan, C. E.		Alabama.	F. Jordan.
Kay, Samuel W.	Philadelphia,	Pennsylvania.	Geo. H. Ashton.
Kearney Howard C.	“	“	Taylor & Wetherbee.
Keffer, Frederick A.	“	“	Beates & Miller.
Kemble, James	Penningtonville,	“	John Goodyear.
Kemble, H. B.	Harrisburg,	“	Charles Ellis & Co.
Kerlin, John H.	Chester,	“	Ambrose Smith.
Lackey, Milford		Virginia.	Hassard & Co.
Letts, Charles	Bordentown,	New Jersey.	Jno. W. Simes & Son.

Levy, Cornelius	Richmond,	Virginia.	S. Chapman.
Levy, Lewis	Trenton,	Tennessee.	Charles Ellis & Co.
Lee, Alfred Henry	Washington,	District of Columbia.	John S. Erben.
Link, Ferdinand		Germany.	M. C. Kreitzer, M. D.
Long, John C.	Lancaster,	Pennsylvania.	T. S. Wiegand.
McClean, Wm. J.	Philadelphia,	"	Benjamin H. Sleeper.
Macpherson, Wm.	"	"	Miller, Fronefield & Co.
McGrath, Charles B.	"	"	A. F. Hazzard & Co.
McIlvain, J. L.	N. Orleans,	Louisiana.	W. B. Thompson.
McKee, James H.		Pennsylvania.	House of Industry.
McQuaid, F. F.	Philadelphia,	"	E. Gaillard, Jr.
Magee, Michael H.	"	"	Garrigues & Magee.
Malcom, Granville	"	"	S. Chapman.
Marple, Enoch W.	"	"	John C. Savery.
Martin, Thomas J.	"	"	Geo. H. Ashton.
Mason, Wm. E. T.	"	"	Robert England.
Mattocks, B.	"	"	W. W. & H. Smith.
Meader, Samuel	"	"	John G. Allen, M. D.
Mecray, Alexander M.	Cape Island,	New Jersey.	Joseph C. Turnpenny & Co.
Mecray, James Jr.	"	"	Charles Shivers,
Milligan, Decatur	Lewisburg,	Pennsylvania.	Geo. T. Shoemaker.
Naulty, W. H.	Philadelphia,	"	Geo. D. Wetherill & Co.
Neely, Shaw	Lancaster Co.	"	Wm. R. Warner.
Newman, G. A.	Chambersburg,	"	Blair & Wyeth.
Parrish, Wm. G.		New Jersey.	Thomas J. Husband.
Parry, George R.	Philadelphia,	Pennsylvania.	Charles Ellis & Co.
Patterson, James B.	Concord,	"	L. M. Emanuel.
Pile, Wilson H. Jr.	Philadelphia,	"	Wilson H. Pile, M. D.
Reeder, Wm. D.	Philadelphia,	Pennsylvania.	Wm. B. Hartman.
Reel, Joseph	"	"	Jno. C. Baker & Co.
Rhoads, Elam	Norristown,	"	Wm. Stahler.
Richards, C. F.	Camden,	New Jersey.	French & Richards.
Richardson, Nath. Jr.		Pennsylvania.	Thos. J. Husband.
Roberts, W. C.		North Carolina.	A. H. Yarnall.
Rulon, Edwin	Swedesboro,	New Jersey.	Ambrose Smith.
St. Clair T. A.	Philadelphia,	Pennsylvania.	Blair & Wyeth.
Scattergood, Thomas	"	"	Geo. J. Scattergood.
Scheller, T. K.	Chambersburg.	"	A. J. Miller.
Sellers, Gilbert L.		"	A. F. Hazzard & Co.
Senneff, Jacob		"	E. B. Vaughn.
Sheridan, John J.	"	"	R. Kilduffe, M. D.
Sheridan, Richard B.	"	"	Charles Ellis & Co.
Shivers, Wm. A.	"	"	E. Parrish.
Shoemaker, Joseph L.	"	"	Jos. L. Shoemaker.
Shoemaker, Richard M.	"	"	Thomas P. James.
Siddall, Robert J.	"	"	Jno. C. Baker.
Smedley, Bennett L.	"	"	A. H. Yarnall.
Smith, Ephraim K.	"	"	Geo. K. Smith & Co.
Sterne, Wm. H.	"	"	A. F. Hazard & Co.
Stoever, J. M.	Mechanicsburg,	"	Robert C. Davis.
Thomas, Lancaster	Philadelphia,	"	R. Shoemaker & Co.
Tuller, Charles	"	"	John Reakert.
Wagner, Joseph	"	"	J. Wagner.
Watson, Charles H.	"	"	Wetherill & Bro.
Webb, R. W.	Windsor,	North Carolina.	Charles Ellis & Co.
Wells, James G.	Norristown,	Pennsylvania.	D. L. Stackhouse.
Wills, Clayton N.	Rancocas,	New Jersey.	Charles Ellis & Co.
Wilson, James	York,	Pennsylvania.	J. P. Curran.
Wendel, John	Philadelphia,	"	W. R. Claridge.
Winter, Jonas	Hagerstown,	Maryland.	James T. Shinn.
Witmer, D. L.	Philadelphia,	Pennsylvania.	A. H. Yarnall.
Woods, Charles	"	"	E. Parrish.
Van Trump, E. A.	"	"	Samuel E. Tyson.
Vincent, Frank L.	Chicago,	Illinois,	Samuel C. Sheppard
Vogelbach, Hermann A.	Philadelphia,	Pennsylvania.	E. H. Stokes.

THE

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MARCH, 1860.

WEIGHTS OF THE PHARMACOPŒIA.

By Alfred B. Taylor.

There seems to prevail a very general impression that the Medical Convention for Revising the Pharmacopœia will, at its approaching session, adopt, among other improvements, some reform in the system of Weights and Measures at present in use by apothecaries. Especially in view of the recent action of the London, Edinburg and Dublin Colleges upon the subject, does it seem probable that some similar modification will be expected and attempted here.

The incongruity and inconvenience of our present duplex tables of weights are too universally admitted to need a condemnation; and the method pursued to unite and harmonize these discordant elements by the British Colleges, after careful deliberation, might appear as being on the whole the simplest and best adapted to effect the object. Without altering the "Apothecaries' *Table*,"—that is, the *divisions* and *denominations* by which the pharmaceutist is accustomed to estimate in compounding his preparations,—the new British system simply reduces the Troy ounce to the value of the avoirdupois ounce. The latter ounce weighing 437½ grains, and the former ounce 480 grains, the new ounce is thus made to weigh $\frac{437.5}{480.0}$ of its former amount; and all the other weights of the apothecary—bodily—are diminished in the same proportion, or, in other words, our grains, scruples, drachms and ounces are all reduced $\frac{17}{192}$ (about $\frac{1}{11}$) in weight.

With a full appreciation of the labor and consideration undoubtedly bestowed upon this reformation, and with as full an appreciation of the ability and high professional authority enlisted in its favor on this side of the water, we yet venture to question its judiciousness, and to suggest what appears to us a preferable scheme. We confess that the new British system does seem to us very much like the discarding of a substance for the retention of a shadow. What virtue is there in 20 times — 3 times — 8 —, that these should be preserved after all their old significance is lost? The surrender of our very *standard* of pharmaceutic weight, the GRAIN, is a sacrifice which ought to be compensated by very undoubted advantages. The grain is perhaps the most important standard unit of our whole metrology. Not only is it at present the recognised measure of the physician and pharmaceutist throughout a great portion of Europe,*—that in which chiefly is embodied the long-acquired experience and accumulated knowledge of the healing art,—the laboriously ascertained and accurately observed relations and values of all the more active portion of the Materia Medica,—but it is the measure, which outside of our profession is the one almost universally employed as the unit of comparison for all minute investigations and precise determinations.

Believing, therefore, that the *grain* is the weight that of all others we can least afford to lose, (unless at the price of a very perfect system in return,) we propose to retain this unit at its present value,—the 7000th part of the pound, *and to abolish all intermediate denominations.* This, it appears to us, would displace the anomalous "Troy weights" with the least practical inconvenience, and would form the simplest mode of reconciling our professional with the common or commercial system. Those who advocate a decimal system of division for weight would probably find this the very easiest and most expeditious method of introducing such a system; for if we had no other unit but the grain, we should of necessity group and compound it by our common decimal arithmetic.

If any one should take exception to the high numbers sometimes involved by this scheme, we would ask which is the more concise and distinct form,—the expression "875 grains," or the expression "℥i., ʒvi., ℈j., and gr. xv.?" Which is the more easily written?—or which the more readily conceived and remembered? Much has been said in praise of the beautiful and simple system of the French; and we seek not here to underrate it: but we should like some earnest advocate of its adoption to show wherein the expression "8 *hecto-grammes*, 7 *deca-grammes*, and 5 *grammes*," (which, translated from its Greek form into plain English, is "8 *hundred-grammes*, 7 *ten-grammes*, and 5 *grammes*;)" we should like the advocate of this, we say, to show in what respect it is better or more convenient than the simple expression, 875 grammes?

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* Holland, which in 1817 adopted the French system of Weights and Measures, still retains the English "Apothecaries' Weight."

So far, then, as the "grain" should be thus employed, it would exhibit practically all the benefits of a decimal metrology, and, in a manner attended with the least possible sacrifice of, or interference with, established values and reckonings. It would relieve the physician from the mental effort of constant reductions in writing his prescriptions. It would have the good effect of dislodging that relic of Latin ignorance—the Roman numeration. It would have the further advantage of abolishing those superfluous cabalistic symbols of weight, which, however precious to the mystery of alchemic craft, are but little congenial with the frank, direct and catholic spirit of modern utilitarianism. And it would diminish materially the risk of error both in reading and in writing medical prescriptions, where error is, alas, too frequently of serious consequence.

There would probably be no occasion for carrying the employment of our proposed "grain unit" higher than 875 grains,—the eighth part of the pound. From and above this weight, we should propose the use of the *eighth-pound*, the *quarter-pound*, the *half-pound*, and the *pound*. The separate weights necessary for the carrying out of our project would be the following:—

Table of Weights.

1 gr.	2 grs.	4 grs.	8 grs.
10 grs.	20 grs.	40 grs.	80 grs.
100 grs.	200 grs.	400 grs.	800 grs.
⅛ lb. (875 grs.)	¼ lb. (1750 grs.)	½ lb. (3500 grs.)	1 lb. (7000 grs.)

It will be seen that the plan here proposed disturbs nothing.

except to a slight extent, the present notation or mode of reading. All the values heretofore employed in the Pharmacopœia remain unchanged. This, in our opinion, gives the "grain scheme" a very great superiority to the avoirdupois scheme adopted by the British Colleges. It is true that their new series of weights differ from the old by only an eleventh part, (an amount perhaps not distinguishable by simple observation,) but this difference is as real, and in a very large majority of cases where these weights are to be applied, is as seriously important, as would be the substitution of the French *milligramme*. The difficulty and labor of acquiring a familiarity with the new weights, and the tedium of constant reductions for a long time to come, would also be as great as if a radically different system had been adopted. By the "grain scheme" no such difficulty would exist. The pharmaceutist and the physician would employ the notation by *grains*, the week after its adoption, with as much facility as they would the present system. Perhaps it would be more correct to say that they would experience an increased facility in its use.

An evil of no slight magnitude in this unnecessary disturbance of familiar values, and in the transitional disorganization unavoidably consequent upon it, is that it would prove a formidable obstruction to any higher and more useful reformation. Men, after having just passed through the labor of a long and troublesome apprenticeship required for the acquisition of any new system, are naturally indisposed to repeat the process soon again with another system, however excellent, or whatever the benefits it may ultimately promise. If the change proposed, therefore, is not one of such value and importance as is likely to secure a *general* and a *permanent* establishment,— if it is not as full and satisfactory a remedy of present ills as might be attained, and thus leaves much to be accomplished at some future time,—this question of the amount of disturbance involved by the substitution becomes a pertinent objection, and is one which should be thoroughly and thoughtfully considered. Not unfrequently have seeming improvements proved barriers to real reforms.

The practical application of the "grain scheme" is so obvious that it would appear scarcely necessary to present an example of its notation. Indeed our present Pharmacopœia exhibits cases where the plan has been adopted in preference to the regular notation, to avoid the use of mixed quantities. Thus, the formula for "Fowler's Solution," (*Liquor Potassæ Arsenitis,*) instead of employing ʒi., gr. iv. for the ingredients, calls for 64 *grs.* each of arsenious acid and carbonate of potassa. In like manner, the formula for *Liquor Arsenici et Hydrargyri Iodidi,* instead of requiring ℈j., gr. xv., calls for 35 *grs.* each of iodide of arsenic and red iodide of mercury. We may add here an example showing the character of change which would be ordinarily required. A simple formula will suffice, as that of the familiar "Dover's Powder," for instance.

Pulvis Ipecacuanhæ et Opii. (U. S. P.)

Take Ipecacuanha, in powder, -	60 grs.
Opium, in powder, - -	60 "
Sulphate of Potassa - -	480 "

Rub them together into a very fine powder.

In cases such as these, this mode of writing would be even easier than the present mode; and it would have the advantage of presenting all the ingredients in measures of the same units, thereby greatly facilitating their comparison and computation, or the estimation of their several divisions where a given number of doses is contained in the preparation. There are, however, some preparations of the Pharmacopœia which are not so manageable, and which in their present form certainly exhibit very awkward proportions. Thus, in the preparation of *Acetum Opii,* (Black Drop,) the quantity of opium is prescribed at ℥viii. (3840 grs., or 1 *half pound,* 340 *grs.*) for 3 pints and 4 ounces of the resulting solution. Now, it is not easy to perceive any good reason for such a proportion as this,—giving $1181\frac{7}{13}$ grs. of opium to each pint of the preparation. The quantity of opium should be instead, 1152 grains to the pint, (1 *eighth-pound,* 277 *grs.*—a reduction of only $29\frac{7}{13}$ *grs.* in the pint,) giving us the convenient proportion of 72 grains to the fluid ounce, (instead of as now, $73\frac{11}{13}$*grs.,*) or of 9 grains to the fluid drachm. And the quantity directed by the formula should be either 1 pint, 2 pints, 4 pints, or 1 gallon. The binal progression (1 oz., 2 oz., 4 oz., 8 oz., 1 pint, 2 pints, &c.) should indeed be the law of quantity for all the mixtures and solutions of the Pharmacopœia.

In the apportionment or distribution in pill preparations of the Pharmacopœia, a similar reform seems greatly needed. The quantities of different pills indicated by the several formulas are properly varied according to the nature and use of the preparation; but they are most usually ordered in numbers having a decimal expression. Thus, among the more common numbers will be found 80, 120, 180, 200, 240, 480, &c.—more inconvenient numbers than which for practical division could not easily be selected. To make a given mass into 180 pills, for instance, is quite a troublesome task, notwithstanding the great variety of factors this number can boast:—(2 × 90;—3 × 60;—4 × 45;—5 × 36;—6 × 30, &c.) The required number may be obtained either by dividing the mass into 12 parts of 15 pills each, or into 10 parts of 18 pills each, or what would be the more usual course, into 9 parts of 20 pills each. But to divide into three parts, and each of these again into three parts, would be very tedious and inconvenient; or to weigh the whole mass, and then weigh off one-ninth part, and divide into pills, and so on successively, would leave the last portion sensibly too light by the drying which would take place in the mean time. The pills would thus be found to be of very unequal value or strength; and the only way to avoid this would be to complete the nine independent weighings at once.

Now, if instead of a system of division so tedious and difficult, we made use of that simplest and most natural of all the scales, —the scale of *final division*,—we may carry the bisection to any extent, with the greatest facility and accuracy, and without any reference to the absolute weights of the several parts. It is the peculiar merit of this scale that we can divide by it any plastic mass, or any given quantity of powder, (or even of a liquid,) into halves, quarters, eighths, sixteenths, thirty-seconds, or sixty-fourths, &c., with perfect precision and with expedition, without the use of any weights whatever; an advantage that can be alleged of no other system of division. Moreover, in the case of a large pill-mass, it would evidently be of no consequence to the equality of the resulting pills what time had elapsed between the first and last division, or how much weight had been lost in the interim by evaporation.

The pill-machines of the pharmaceutist, as ordinarily constructed, are provided with twenty-four grooves, for the division of pills: a very suitable and convenient number. The reform, then, that we propose on this subject is, that accepting the number 24 as the unit, all the pill formulas should be based in quantity upon multiples of this unit, and in the binary scale of progression; that is, we would have all the pills of the Pharmacopœia ordered in quantities of 24, or of 48, (2 times 24,) or of 96, (4 times 24,) or of 192, (8 times 24,) or of 384, (16 times 24.) There is no occasion whatever for any intermediate quantities. An example or two of the change indicated will illustrate fully the project. Thus, the formula for the "Compound Cathartic Pills" of the Pharmacopœia specifies ʒiv., ʒiii. and ℈ii. of the respective ingredients, and 180 for the number of the pills. The new form we propose would be as follows:—

Pilulæ Catharticæ Compositæ.

Take of Compound Extract of Colocynth	256 grs.
Extract of Jalap - - - -	192 "
Calomel - - - - -	192 "
Gamboge - - - - -	48 "

Mix and make into 192 pills.

The only difference between this pill and that of the Pharmacopœia is the use of one-fourth of a grain of gamboge, instead of the rather awkward amount of two-ninths of a grain, ($\frac{3}{4}$ gr. in a dose, for $\frac{2}{3}$ gr.)—an addition of $\frac{1}{36}$ gr. to each pill, or of $\frac{1}{12}$ gr. to the dose,—a difference wholly insignificant, when it is considered that the full dose of gamboge is from 2 to 6 grs. The object of this change is of course merely to avoid the inconvenient amount of 42$\frac{2}{3}$ *grs.*, which would be required by the present formula.

Pilulæ Ferri Iodidi. (U. S. P.)

Take of Sulphate of Iron - - - -	72 grs.
Iodide of Potassium - - -	96 "
Tragacanth, in powder - - -	12 "
Sugar, in powder - - - -	36 "

Beat with syrup, and make into 48 pills.

Pilulæ Ferri Compositæ. (U. S. P.)

Take of Myrrh, in powder	144 grs.
Carbonate of Soda	72 "
Sulphate of iron	72 "
Syrup, q. s.	

Mix, and make into 96 pills.

Pilulæ Scillæ Compositæ. (U. S. P.)

Take of Squill, in powder	96 grs.
Ginger, in powder	192 "
Ammoniac, in powder	192 "
Soap	288 "
Syrup, q. s.	

Mix, and make into 192 pills.

Pilulæ Aloës et Myrrhæ. (U. S. P.)

Take of Aloes, in powder	768 grs.
Myrrh, in powder	384 "
Saffron	192 "
Syrup, q. s.	

Beat together, and make into 384 pills.

These formulas are sufficient to show the convenience of the system, and its adaptation to any range of quantities. By the apothecary, at least, the great advantages of this principle of distribution will, we imagine, be at once and universally recognised; and as it is upon him that the obligation of a faithful dispensation of the provisions of the Pharmacopœia rests, we suppose it will be generally conceded that his convenience should be chiefly consulted in a matter which, like this, can affect directly the interests of no one else.

Philadelphia, Feb., 1860.

EXAMINATION OF OIL OF PEPPERMINT.

By John M. Maisch.

In the last volume of the Amer. Journ. Pharm., page 552, Mr. C. Bullock has drawn attention to an oil of peppermint which has made its appearance in our market, and which shows in many respects such a different behaviour from pure oil of peppermint, that it has been supposed to be an adulterated article. A sample of the oil has been subjected by Mr. E. Parrish to fractional distillation, and besides the resinous residue in the retort seven fractions were obtained: 1, below 300°; 2, 330°; 3, at the boiling point, 338°; as the boiling point now rose, the following fractions were collected: 4, below 344°; 5, below 360°; 6, below 430°; 7, above 430°F.; all were colorless except No. 7, which was of a light yellow.

These samples were handed to me for further examination, and Prof. Procter kindly furnished me with a specimen of oil of fireweed, (Senecio hieracifolius,) which, it had been suggested, might probably be the adulteration. I likewise obtained a sample of double rectified German, of Borton's, and of an article called New Jersey oil of peppermint, of oil of cedar, and pure oil of spearmint, for comparing the various reactions. It is well to state here, that the above freshly distilled fractions were nearly inodorous; the faint smell could not be distinguished, and only that of the last portion reminded somewhat of peppermint.

My experiments make it certain that the oil has not been adulterated by the oils of fireweed and of cedar; but it appears to me more than probable that oil of turpentine is the fraudulent admixture.

Oil of fireweed dissolves at 60° in 9 parts of alcohol, and remains clear on the addition of 60 parts more; it dissolves iodine at 60° and 80°, with little reaction, and without the evolution of vapors, to a pale brownish red liquid, which spreads with a greenish color and evaporates entirely; from an ethereal solution of iodine, it takes up but little iodine and evaporates, leaving a soft resinous mass behind; with an ethereal solution of bromine it produces a hissing noise, and a yellow color, and evaporates without thickening previously.

Oil of red cedar dissolves at 60° in one part of alcohol, is rendered turbid by 2½ parts, and not clear by the addition of 50 parts more; it dissolves iodine slowly without any visible reaction, and mixes with an ethereal solution of bromine to a colorless, clear liquid.

Borton's oil of peppermint is dissolved by one-half part of alcohol, and rendered turbid by another half part, and more; it takes up iodine with but little reaction, thereby assuming a red and brownish red color, without the least spreading; ethereal bromine yields a deep rose color, darkening to a purplish black, and thickening the oil. The rectified German oil agreed in its pure state, and when mixed with other oils, so nearly with Borton's oil, that the reactions of one are nearly identical with the reactions of the other.

The supposed spurious oil requires six parts of alcohol for solution, and remains clear on the addition of more; at 60°, iodine has but little effect, at 80° it is dissolved without fulmination, but with a quick radiating motion, without evolving any vapors, forming a reddish brown liquid, which scarcely shows any spreading. This oil mixed with ethereal solution of iodine and of bromine forms a thick brown liquid.

The fractional distillates dissolved, commencing with No. 1, in 8½, 8, 4, 7½, 7½, 7, 1, parts of alcohol and more. They fulminated with iodine, Nos. 3 and 6 last, evolved purple, yellow, grey or white vapors; the solutions were brown, variously shaded with green, Nos. 1 and 2 thin, 3 honeylike, 4, 5, and 6 more fluid than 3; they all showed spreading, 6 the least; No. 7 dissolved iodine to a homogeneous reddish brown liquid, without any reaction and without spreading. These reactions with iodine were observed at 80°; at 60° no fulmination took place, only a quick dissolution or a radiating motion. With ethereal solution of iodine they produced uniform thin liquids of various shades of brown, containing a sediment of iodine. No. 7 was rendered reddish brown and thickening. With ethereal bromine they produced spreading liquids, 1, 2, 3, 4 colorless, 3, 4 with purplish spots, the liquids assuming a greenish tint; 5, yellowish green, 6, brownish yellow; both spreading, with a brown color; No. 7, behaviour of Borton's oil.

Towards nitroprusside of copper, the oils showed the following behaviour: cedar, no change; fireweed, slowly golden yellow, clear; Borton's, pale green, clear; spurious, by continued boiling, light brownish yellow, turbid, soon clear; No. 7, green reddish brown, turbid, soon clearing; No. 1 assumes with difficulty a light yellow shade, turbid; the others remained nearly colorless, assuming with difficulty a scarcely observable brownish, greenish or yellowish tint.

It will appear from these reactions that an admixture with turpentine may be thought probable, and as I had occasion to rectify some turpentine, I experimented with it. It was perfectly colorless, and almost free of the peculiar penetrating odor and the hot, pungent taste of the common oil; it dissolves in 8 parts of alcohol at 60°, with 1-10th of Borton's peppermint in 7 parts, with 2-10ths in 3½ parts, and the solutions remain clear with more alcohol; mixtures with from 3-10ths to 9-10ths dissolve in ¾ or ½ part of alcohol, and the solutions are turbid with 1½ p. of alcohol.

The reactions of a mixture of 5 p. oil of turpentine with one of peppermint, when brought in contact with iodine at 60 and 80°, with ethereal solution of iodine and of bromine, and when continually boiled with nitroprusside of copper, are precisely the same as those of the fractions, particularly 3 and 4.

Fraction No. 7 agrees in many respects with Borton's oil; the principal difference is their solubility in alcohol. As I have been unable to produce a mixture of oil of peppermint with turpentine, cedar, fireweed, spearmint, and several other oils, which would dissolve in from one to three parts of alcohol, and more, I was at one time inclined to suppose the spurious oil in question to be the oil of some other species of mint, some of which have a resemblance in odor with peppermint. This supposition was strengthened on finding in Darlington's Flora Cestrica, page 340, the following sentence: "This species (Mentha canadensis s. acutifolia, *var.* borealis,) is not so pleasantly aromatic as the preceding (M. piperita), its flavor more resembling that of Hedeoma or pennyroyal." I was unable to obtain any further information regarding its odor, or to find any oil of this plant. As it is said to be a common herb, it would perhaps be well for some of our pharmaceutists to direct their attention to it, with a view of ascertaining the properties of its oil, and whether the plant is distilled indiscriminately with peppermint.

Zeller requires good oil of peppermint to be soluble in between one and three parts of alcohol of ·85, and to become turbid with more. I have not met with any great difficulties to procure oil of that behaviour towards alcohol of ·835. The New Jersey oil mentioned above, however, dissolved in ½ p. alcohol and remained clear with 60 p. c. more; it dissolved iodine only by continued agitation, produced with ethereal bromine a green, spreading, scarcely thickening liquid, and was rendered yellow by nitroprusside of copper. I supposed this to be an adulterated oil; but since, I have obtained two specimens of Borton's oil, which, though agreeing in every other respect with the reactions of the above sample of his make, are dissolved by ½ and ¼ parts of alcohol without being rendered turbid by more. Though crude oils, their flavor appears to be a pure peppermint, and the question now arises, What influence has the soil, the maturity, and the age of the herb on the solubility of the oil obtained from it? I consider it an important question, and probably some one who has access to peppermint plantations will take it up for the common benefit of all.

As the matter now stands, it seems to me that Zeller's test with alcohol cannot be relied on for *all* oil of peppermint. Borton's first specimen, when in excess in a mixture with oil of fireweed, dissolved in from ½ to 1 part of alcohol and become turbid by from 1½ to 1¾ parts; with the fireweed in excess, it required more alcohol for solution, but even an admixture of ·2 of peppermint, rendered the solution slightly cloudy though not milky.

On the other hand, to the last mentioned specimen of Borton's and the New Jersey oil, the property of dissolving in, and becoming turbid with, more alcohol, may be imparted by oil of red cedar; a mixture containing only ·3 of the latter, dissolved in ½, and was slightly turbid, with 3½ p. c. alcohol. But such mixtures were not changed in color by nitroprusside of copper, unless the boiling was continued for some time.

For the strength of the test liquids and the manner of applying the various reagents, I have to refer the reader to my papers in the Proceedings of the Amer. Pharm. Ass., for 1858 and 1859. The reactions of my rectified oil of turpentine were identical with those published in the Proceedings for 1859, page 345.

I am unable to give the precise per centage of turpentine in this oil. From 8 oz., Mr. Parrish obtained about 5 oz. of distillate, of which, No. 7 weighed about 1 oz.; the resinous residue in the retort not having been examined, the adulteration with turpentine must amount at least to 50 per cent.; but to judge from the solubility of the spurious oil in alcohol at 60° F., it may amount to more than 80 per cent. This latter supposition, though, is not verified by the behaviour of the undistilled spurious oil towards ethereal solution of bromine; the reaction with this test seems to indicate that the adulteration has been performed with a highly resinified oil of peppermint and oil of turpentine in about equal weights.

Philadelphia, Feb., 1860.

NEW PROCESS FOR THE PREPARATION OF VALERIANATE OF AMMONIA, IN DRY CRYSTALS.

By Benjamin J. Crew.

Having experienced, along with many others, considerable difficulty in obtaining crystallized Valerianate of Ammonia in quantity, by any of the published formulæ, I was induced to make a series of experiments, which, having been entirely successful, I am willing to make public for the benefit of other operators.

The first step in the preparation of this salt is to procure the *monohydrated valerianic acid*, or the *oily inflammable acid.* The terhydrated acid will not produce crystals under any circumstances, or with any amount of manipulation; a very dense solution may be had, but it will not crystallize, even if the temperature be reduced to zero. To procure the monohydrated acid, take of valerianate of soda a convenient quantity, say 5 lbs., boiling water just sufficient to dissolve, strain the solution through muslin, if necessary, and add oil of vitriol by degrees until no further action is induced, or until the valerianate of soda is entirely decomposed. Allow the mixture to stand a short time, that the valerianic acid may rise to the surface and separate into a distinct layer, which may be drawn off with a syphon, separating funnel, or pipette. This acid (which still contains sufficient water to prevent perfect crystallization) should be poured into a cylindrical jar, and treated with a small portion of oil of vitriol, and agitated by inserting a tube through the acid and blowing with the mouth; the passage and regurgitation of the air bubbles mixes the whole thoroughly; allow the mixture to stand a few minutes; the oil of vitriol seizes the water and subsides with it. Now test with a hydrometer the supernatant acid, and should it mark a sp. gr. of ·950, this part of the process is complete; if above this, add a second portion of oil of vitriol, which should bring it to this degree of strength. The acid, after thorough subsidence may now be drawn off by either of the processes above indicated. As thus prepared it is somewhat colored, contains a small portion of sulphuric acid, and also a portion of water. From these impurities it is freed by distillation from a glass retort. In this process there are a few points to be attended to upon which perfect success must depend. The distillate should be received into a hydrometer jar, and each portion tested with a hydrometer. The first portion that comes over contains considerable water, and must be rejected and laid aside for further manipulation; when the distillate marks ·940 it may be retained. The distillation is now proceeded with, producing a portion of acid of ·930, until white vapors appear in the retort, when the gas flame is immediately withdrawn. The portion coming over first should be treated with oil of vitriol, the water abstracted and added to the retort, and the operation finished with care. The mixed distillates indicate a sp. gr. of about ·933, perfectly clear, colorless, and of high refractive power. When thrown into water, it rises immediately to the surface, floating like an oil, burns with a blue flame, and acts with much energy upon the tongue and lips, producing a white spot and destroying the cuticle. The next stage of the process is far more simple and easy of execution, and consists in the saturation of the acid with dry gaseous ammonia, prepared by heating, in a suitable vessel, hydrate of lime and muriate of ammonia, in proper proportions, and passing the gas through a bottle containing fragments of quick lime. Ammonia is passed in until litmus paper is not acted on. No attention is paid to keeping the acid cool. The temperature rises to about 150°, keeping the liquid thin, and thus preventing the stoppage of the tube with crystals.

It should then be set aside to crystallize. In a few hours it becomes nearly or quite solid. If necessary, the crystals may be thrown upon a funnel, and allowed to drain, and finally laid upon bibulous paper. As thus prepared, they are perfectly snow-white, perfectly dry, and not deliquescent. Some specimens exposed to the air for several days appeared to effloresce.

Philadelphia, 1st *mo.* 16, 1860.

REMARKS ON PROPYLAMIN.

By Dr. R. H. Stabler.

Esteemed Friend, Wm. Procter, Jr.:

In the number of the Journal for "March," 1859, the process for preparing Propylamin was published, together with the experience of Dr. Awenarius of St. Petersburg, as to its use in acute and chronic rheumatism, which appeared so well supported by well conducted clinical experiments as to entitle the remedy to a trial in this hitherto unmanageable disease.

I prepared a portion of it from herring pickle soon after reading the article, and induced some of our physicians to use it in their practice, which resulted in establishing its reputation amongst us as an indispensable remedy. It has been in use here about nine months, and has been administered in about fifty cases with most marked effect, seldom failing to give relief in twenty-four or thirty-six hours in acute cases, and a longer time in chronic rheumatism. I think its great value is demonstrated in acute rheumatism of young subjects, where the disease, unless quickly controlled, is so liable to attack the structures of the heart. One case of the kind presented in the practice of Dr. I. J. Murphy of this place, in a little boy; commencing with swelling of the knees, ancles and other joints, high fever, full, bounding pulse, and other symptoms promising a long, tedious case under the usual modes of treatment; he was directed to take the propylamin in the usual doses, [2 or 3 drops in water for an adult,] and was convalescent in three days. Another physician told me a few days ago he had used it with much satisfaction and uniform success.

A good deal has been published on the preparation and administration of the remedy in the Journal and other periodicals, but nothing as to its use in this country that I have met with; thinking it might interest thy readers to describe our experience with it, and perhaps induce further trials of it, is my apology for troubling thee with this letter.

Thy friend,
R. H. Stabler, M. D.

Alexandria, 1*st mo.* 25*th*, 1860.

ON SOME PREPARATIONS OF CALAMUS ROOT.

By Johm M. Maisch.

The gratefully aromatic odor and taste of calamus root have caused it to be regarded as a valuable domestic medicine in many parts of this and the old continent; but the use of this drug in regular practice is extremely limited in this country. There can be but little doubt, that, in a great measure, this neglect of such a pleasant and strong indigenous aromatic is owing to the want of suitable pharmaceutical preparations which might be offered to the inquiring physician. In 1857, in a communication to the American Pharmaceutical Association, I have drawn attention to this fact, and suggested a tincture of the strength of four ounces to the pint. Lately, I have induced Mr. George E. Hayes, of Ga., a student of the Philadelphia College of Pharmacy, to make some experiments, with a view of arriving at concentrated and pleasant preparations of this hitherto neglected remedial agent. The following embraces Mr. Hayes' results, together with other observations and suggestions on the same subject:

Extractum Calami Fluidum was prepared from the powdered root in accordance with Professor Procter's directions for his sixth class of fluid extracts. (See Amer. Journ. Pharm., 1859.) Sixteen ounces of the powdered root passed through a sieve of 50 meshes to the inch, was moistened with alcohol, pressed into a cylindrical percolator, and alcohol allowed to slowly pass through it; the first 12 fluid ounces being reserved, the remainder of the tincture was evaporated below 160° to 4 fluid ounces, and added to the reserved portion. A slight turbidity was thereby occasioned and the extract was set aside to settle, which process took place slowly but completely; the sediment proved to be entirely composed of larger and smaller globules of oil. I have separated a portion of this oil by means of a pipette, and distilled it from a solution of common salt in a small flask; the milky distillate, as well as the residue, was shaken with ether, and the ether allowed to evaporate in a watch crystal. The ether from the distillate left after evaporation a trace of volatile oil; that from the residue in the retort left a semi-fluid oleoresinous mass, of a taste which was at first insipid, somewhat resembling the taste of good olive oil, but subsequently reminded strongly of the peculiar hot aromatic taste of calamus root; this latter product is doubtless the soft resin of Trommsdorff; the quantity obtained was too small to institute any further investigations. From the fact, however, that this resin was but partially soluble in alcohol of .835, while a large portion of it separated in oily drops, which were not soluble in alcohol, soluble in ether, and left a grease spot on paper, we have to conclude that calamus root, besides those constituents found by Trommsdorff, also contains some fixed oil. It must be remarked, that the root used for these experiments was derived from our indigenous plant and had not been peeled.

Syrupus Calami.

Take of Fluid extract of Calamus,	one fluid ounce,
Sugar,	fifteen ounces,
Water,	half a pint.

About one-half of the sugar is to be triturated with the fluid extract of calamus, and the mixture exposed to a moderate heat until all the alcohol has been evaporated; the remainder of the sugar is then added, and after the addition of the water, the whole is raised to the boiling point and strained. One pint of syrup is thus obtained which possesses the virtues of an ounce of the root; it is turbid like the syrups of tolu and ginger prepared in a similar manner. Incidentally, I may remark here, that in the syrups mentioned, we ought not to sacrifice strength to appearance; the tinctures of tolu and ginger when triturated with magnesia, and freed from alcohol by evaporation, will certainly yield a clear filtrate with water, and a transparent syrup on the addition of sugar; but the resins are wholly left behind and they are by no means inactive in a medicinal point of view. If we therefore wish to preserve for these syrups the character of medicinal preparations, and not degrade them to mere flavoring liquids, we ought to retain besides the volatile oils also the resinous matters. The process of our present Pharmacopœia I consider unobjectionable, if strictly followed; frequent agitation of the powdered sugar while the alcohol is being evaporated, not only favors this process, but likewise the intimate mixture of sugar and resin, and the complete subsequent suspension of the insoluble matter in the saccharine liquid.

Calamus Cordial.—In attempting to make such a preparation from the above fluid extract, Mr. Hayes found that but a small portion of the same could be obtained in perfect solution in a diluted alcoholic liquid as they are generally employed for this class of fancy preparations. The following appeared to be the most available and pleasant:

Take of Fluid Extract of Calamus,	two fluid drachms,
Tincture of Cinnamon,	" "
Syrup of Orange Peel,	seven fluid ounces,
French Brandy,	seven and a half fluid ounces.

Mix them.

This preparation is transparent, of a reddish yellow color, and has a strong but agreeable calamus taste. The sugar of the syrup, which keeps the oleoresinous matter perfectly suspended, appears to rather better disguise the persistent calamus taste. The cordial contains a large amount of alcohol, and each tablespoonful represents nearly four grains of the root.

Trochisci Calami.—The following preparation is offered as a very agreeable way for giving calamus in cases of flatulency and dyspepsia.

Take of White sugar,	six ounces,
Fluid Extract of Calamus,	one fluid ounce,
Oil of Fennel,	twenty minims,
Oil of Aniseed,	" "

Rub them together, and with mucilage of tragacanth form a mass which is to be divided into 160 lozenges, each of which will represent three grains of calamus, and about one-fourth of a drop each of oil of fennel and anise.

It is not deemed necessary in this place to dwell much on the medicinal qualities of calamus root; the above preparations are offered to physicians and pharmaceutists merely to direct their attention to this grateful indigenous aromatic. While referring to the remarks of Prof. Wood, in the U. S. Dispensatory, it may probably not be amiss to quote from Pareira's Materia Medica, where the following language is used: "It is rarely employed by medical practitioners, though it might be frequently substituted, with good effect, for the more costly oriental aromatics. It is a useful adjunct to other stimulants and tonics. It has been employed in continuous asthenic fevers, accompanied with much prostration of strength, and greatly weakened digestive power. For the cure of the ague the dried root powdered is used by the country people in Norfolk. It is well adapted for dyspeptic cases, accompanied with, or dependent on, an atonic condition of the digestive organs, and is especially serviceable in gouty subjects. It has also been used as a local agent, viz.: in the formation of aromatic baths, poultices and gargles, as an application to foul-conditioned ulcers, &c."

In conclusion I give the recipe for *Calamus Toothpowder*, which has been successfully employed by Dr. Pitschaft in scorbutic or ulcerated affections of the gums and carious teeth.

Take of Calamus Root,	half an ounce,
Charcoal,	one drachm,
Castile Soap,	" "
Oil of Cloves,	twenty minims.

Rub them together into a very fine powder.

Philadelphia, Jan., 1860.

OPIUM AS A THERAPEUTIC AGENT.

By Edward R. Squibb, M. D.

Opium as an article of general commerce, in common with other articles of less importance, is judged and selected by inspection of its sensible properties. Whatever relation these sensible properties may bear to its medicinal value, they certainly are in no degree dependent upon the alkaloids it contains, for, neither in their natural nor artificial combinations do the more important alkaloids possess a single sensible quality or property in common with the opium from which they come, except the bitter taste. Hence it must be apparent that the mere act of judgment applied to opium, can be of little other value than to discriminate by a certain physiognomy the class or commercial variety to which it may belong, and its freedom from unusual, or clumsy adulteration or admixture. Any one, therefore, with even a small experience in the assay of opium will give little credit to the assertion of opium judges, that by simple inspection of its physical properties they can tell within a fraction of one per cent., how much morphia any given specimen or case of opium contains.

Authorities agree pretty well upon the general fact that opium without any secondary adulteration varies in morphia strength from 2 to 22 per cent., in the different varieties met with in commerce. But, excluding from consideration here the lower grades, such as the Egyptian and India varieties, which may always be avoided by inspection, and the very high grades of European cultivated opium which are never met with in the common market, and thus confining these remarks to that variety almost exclusively met with in our markets, the following results have been obtained.

The Smyrna opium examined was of the qualities known commercially as "prime" and "strictly prime," and the number of critical assays made within the last six years, of which reliable notes were kept, and excluding those where there could be any suspicion of damage or sophistication, is ten. In all these the assay was confined to morphia alone, but the amount of water lost in drying sufficiently to powder the opium was also taken in many instances, and an average loss for the water was established. Upon this average loss of 21 per cent., the specimens of powdered opium examined were calculated back to their original condition of moisture, and the percentage is based upon the calculated weight for such specimens. Subsequent observations and a larger experience go to show, however, that this, as a general average, is a little too high ; for although individual experiments with quantities of 10 to 20 lbs. will occasionally lose 24 and 25 per cent. in drying sufficiently to powder, other individual cases are met with where the loss is as low as 17 per cent. The average loss now supposed to be nearer the true expression, is, for drying 19.5 to 20 per cent., or in drying and powdering 20 to 21 per cent., provided the powder be not exposed to attract moisture from the air after powdering. Then, as may be seen by the table, powdered opium contains as usually met with over 8 per cent. of moisture, or when carefully put up and well kept about 6·3 per cent. The amount of moisture in the powdered specimens was determined by exposing them to a temperature of 212° until they ceased to lose weight.

Quantity examined.	per centage of morphia.		per centage loss in drying.	
	in powdered opium.	in commercial opium.	in powdered opium.	in commercial opium.
Sample of powdered opium.	9.21	8.10	9.47	21. calculated.
" " "	8.55	7.37	8.34	" "
" " "	7.31	6.16	6.18	" "
" " "	7.44	6.26	6.10	" "
76 lbs. of opium.	9.32	7.87	6.31	20.967 actual.
1 " "		8.		
18 " "		7.77		23.343 "
2 " "		5.15		19. "
6 " "		8.32		19. "
1 " "		11.15		18. "

Within the extremes of this table there is a variation of 6 per cent. in the morphia strength, or admitting the quantity of morphia as an index of the therapeutic value of the opium, the dose being the same in all these instances, the therapeutic effect would be two and one-sixth times greater in one case than in the other, whilst in no two instances could it be exactly the same; and yet this table is, in itself, a mean between greater extremes, or at least is very far from the lowest extreme, since the writer has examined at least two specimens of powdered opium furnished by respectable sources that contained less than 1.5 per cent. of crude morphia.

The writer's observations lead directly to the conclusion that in every case of opium imported lumps could be found yielding at least all the variety of percentages of the above table, and therefore that there is no way of using opium therapeutically with a hope of even approximative uniformity in dose, except in the form of powder. And even in this form, when well made from large quantities, the ultimate extremes only are avoided.

If these conclusions be well based, the pharmaceutist who buys his opium one or two lumps at a time, and who may make his own powder from it, can never, except by accident, supply the physician with preparations of the same therapeutic power, for any great length of time.

Two circumstances in explanation of this great variation in the strength of opium, deduced from the writer's limited knowledge of the history of the drug, and not noticed in the works on Materia Medica within his reach, are, first, that the poppy, in common with other plants, must so exhaust the soil upon which it is cultivated year after year that its chemical products may vary and deteriorate in the ratio of this exhaustion. And secondly, that the opium reaches Smyrna in small lots from various sources, is there thrown together in heaps in the storehouses as it accumulates day after day during the season of transportation, and after inspection is boxed up indiscriminately from these heaps, so that any single case may in its various lumps represent a great variety of original locality, individual management, soil, and even climate.

Under such circumstances it must be true that no therapeutic applications of opium can be uniform in effects or results, and that it cannot therefore properly meet many of the indications to its use.

The remedy for this that naturally first presents itself, is a reliance upon the salts of morphia. But apart from the variability of effects noticed in the use of these salts as found in the market, most observers have found that there are certain good effects obtained, or certain unpleasant consequences avoided, more frequently by the use of the natural combination, while all agree that the whole therapeutic power and influence of opium cannot be obtained from any salt of morphia. Taking the whole profession of medicine of all countries in connection with this well known want of uniformity in the medicinal power of the drug, it is a remarkable and significant fact that so large a proportion of the profession adhere to it and to these preparations which most nearly represent it, for certain and very numerous purposes, in preference to salts of morphia, so that repeated and continued efforts are made to improve the class of preparations in which its natural condition is preserved, and one or two such preparations are found in habitual use in almost every nation or country. Some of the best of these have always been made by secret and proprietary formulæ, and are largely used even by the profession notwithstanding. It is not known, and perhaps not probable, that in any of these preparations any attempt is made to correct the want of uniform strength of the drug, and indeed one at least of the most popular of these is rather remarkable for a want of uniformity in effect. But effort seems to have been chiefly directed first to preserve the natural condition and combination of the constituents; and secondly, to exclude certain inert matters and other constituents supposed to produce unpleasant effects. In France, however, there has been an effort recently made with the direct object of attaining uniformity of strength. A preparation has been introduced as "opium titré," made by mixing the contents of an entire case of opium into a magma with water, adjusting the strength of the whole to a given standard by abstracting insoluble inert matters from it, drying to a given consistence, and finally putting it up in stamped packages of fixed weight, enveloped in tin foil.

This method is liable to the grave objection that it is not generally applicable, but must be confined to the large manufacturer, since, to obtain good average results, large quantities must be operated upon.

To accomplish the desired object of uniformity in this important drug, and to introduce into pharmacy the principal of assayed solutions, the writer has constructed and practised a formula now to be given, which, from the limited trials to which the preparation has been put, encourages the hope that upon further application it may be found of sufficient importance to be admitted to the Pharmacopœia.

It is not proposed as an unobjectionable preparation, nor as one that meets all the desired indications, nor certainly not as a preparation that will either do or avoid what the best specimens of opium in substance would. But it is simply offered as a skilfully constructed preparation of uniform strength, wherein much of the inert and objectionable matter of the opium is avoided, and the sedative anodyne effect preserved in known and controllable quantity.

When opium is given in large doses it seems often to meet the indications to its use with a shock or concussion, and in proportion as the impression is profound and continued, and in proportion as it over-reaches the desired object, in the same proportion is the subsequent reaction, producing depression, anorexia, nausea, headache, &c. Now in medicine as in mechanics, it would be fallacious to expect to control a reaction independent of control of the power producing it, and therefore the writer never supposed that any preparation of opium could be made to produce the full opiate effect without the corresponding reaction, but only hoped that by having a preparation of known and fixed power, the indications might, by proper graduation of dose, be just met and not over-reached, and that thus the rebound or reaction might be avoided in measure. In regard to this preparation thus far, there does seem to be force in this reasoning, and truth in the practice, that it does produce less profound narcotism, a sleep that has less of coma about it, and of a more normal character than the opium in substance or its tincture, and that the unpleasant after-effects are far less, both in quality and degree.

The combination with even so small a proportion of the compound spirit of ether as 12½ per cent. seems also to have a modifying influence which for a great majority of cases overbalances the disadvantages of the odor, taste, and even the injurious medicinal effect of this agent in a few instances. The combination, however, is one long and favorably known in the profession, and one to the value of which the writer can bear personal testimony. The quantity of the Hoffman's Anodyne introduced into the preparation is so guarded, as to be sufficient, as is supposed, to protect the watery solution from change by keeping, and at the same time not large enough to interfere with its use where anodynes are required in acute inflammatory affections.

LIQUOR OPII COMPOSITUS.

(*Compound Solution of Opium.*)

By Edward R. Squibb, M. D.

Take of Opium, sliced,	16 parts,
Compound Spirit of Ether,	a sufficient quantity.
Ether, fortior,	12 parts,
Alcohol,	112 parts,
Water,	a sufficient quantity.

Digest the opium with four times its weight of water for twenty-four hours, with occasional stirring during the first twelve hours. Then having disintegrated it thoroughly with the hand, transfer it to a paper filter, and when it has drained, percolate the residue with sixteen parts of water. When it has again drained, transfer the residue, by portions of about two parts each at a time, to a piece of strong muslin, and wring out the liquid from it by strong expression with the hands. Return the liquid obtained by expression to the filter; break up the expressed residue, and having digested it again for twenty-four hours, with thirty-two parts of water, and with thorough working with the hands, transfer it again to the filter, drain it, percolate it with sixteen parts of water, and express by wringing, as before. Repeat this digestion, rubbing with the hands, percolation and expression with sixteen parts of water again twice, making four times in all.

Evaporate the filtrate by rapid boiling in a tared tinned vessel of the capacity of sixty-four parts, stirring constantly toward the close of the evaporation, until it weighs twelve parts. Then add to the concentrated solution in the vessel, forty-two parts of the alcohol, and having boiled the mixture for five minutes with constant stirring, set it aside in a cold place for an hour. Decant the liquid from the undissolved residue into a vessel of the capacity of one hundred parts, and repeat the boiling of the residue with alcohol three times, twice with twenty-eight parts and lastly with fourteen parts, allowing to each solution an hour to cool and deposit insoluble matters. Mix the alcoholic solutions as they accumulate, and allow the whole to stand twenty-four hours in a cold place.

Pour off the clear alcoholic solution from the deposit, and evaporate it by boiling, (or distil off the alcohol,) until the concentrated solution weighs ten parts. Agitate this in a bottle with six parts of the stronger ether, separate the ether by decantation, and repeat the washing with the remainder of the ether, and separate it in the same way. Throw the ethereal solution away, and dissolve the washed extract in water by agitation in a tared bottle, and having diluted the solution till it weighs eighty parts, agitate it occasionally during twenty-four hours, filter it through paper, and wash the filter with water till the solution weighs eighty-five parts. This solution is then to be assayed, to ascertain the proportion of morphia it contains, as follows:

The Process of Assay.

Take of Solution of Opium,	464 grains,
Alcohol,	380 "
Solution of Ammonia,	22 "

Weigh the solution of opium in a carefully tared capsule, of a capacity of about three ounces, add to it one half of the alcohol and stir the mixture. Add the solution of ammonia to the other half of the alcohol in a separate vessel, mix them, add the mixture to the contents of the capsule, stir the whole together and set it aside for twenty-four hours, protected from dust but not covered. Decant the clear liquid carefully and slowly off from the crystalline deposit and dry the crystals in the capsule, at a temperature of 212° for half an hour. Finally cool the capsule and contents, weigh them closely and subtract the weight of the capsule. The remainder is assumed for the weight of the morphia.

Multiply the weight of the morphia by seventy-nine and divide the product by four. Then multiply the quotient by four hundred and fifty-five, and divide this product by four hundred and fifty. The last quotient will be the number of parts by weight to which the solution must be made up in finishing it; and this quotient divided by eight will give another quotient indicating the number of parts by weight of compound spirit of ether to be added to the solution in finishing it.

The Dilution or Finishing.

Finally, upon the result of the assay, add to the solution of opium the proportion of compound spirit of ether indicated, agitate the mixture well, add a quantity of water sufficient to make up the required weight, shake the whole well together, digest with frequent shaking for one week, and filter through paper.

Each fluid ounce (of four hundred and fifty grains) of this solution contains four grains of morphia, (equivalent to 5·33 grs. of sulphate of morphia,) and fifty-six grains of compound spirit of ether, and is of the same morphia strength as the officinal tincture of opium, provided the powdered opium from which the tincture is made contains precisely ten per cent. of morphia. In sedative effect, however, it is less active. Compound solution of opium is a dark wine-colored liquid, but not so dark as tincture of opium. It has a fragrant ethereal odor, but is almost devoid of opium odor, and has a bitter taste. It is acid to litmus paper, and forms a copious precipitate with ammonia and with alkaline carbonates. Its s. g. is ·995. When slowly evaporated to one half its volume, and subjected to the process of assay by which it is adjusted, it yields 0·88 per cent. of morphia.

In order to exhaust opium thoroughly some little skill is required. It is best not to work it with the hands at first, but by simple stirring and keeping it loose, to favor more rapid disintegration. It is best to use a large proportion of water at first as directed, because the opium is thus far more perfectly exhausted by the first maceration, and the succeeding maceration rendered more effectual. By very skilful management the object may be attained with less water. But it is safer, and more applicable to all degrees of dryness of the drug, to use the full quantity and manipulation directed. The percolations upon a filter very much facilitate the exhaustion, and these to be effective must be performed continuously. That is, the residue must not be allowed to drain so close as to contract and become impacted before the whole of the water has been poured on, for when it contracts and separates from the sides of the filter the percolation is very imperfect. If the residue be removed from the filter carefully, and the funnel containing the filter be covered with a wet cloth, the same filter will serve for the entire process. But if the filter be exposed to the air and be allowed to dry, it becomes almost impervious, so that a new one is required for each maceration. The expressing the residue can only be well accomplished by taking small portions at a time, and making them—not into a round ball in the cloth—but into a long mass, not thicker than two fingers, and then wringing this strongly in the cloth. When a press is used the resinous matter and coutchouc are pressed into or through the meshes of the cloth so as to render the cloth nearly impervious, while the liquid is entrapped within. No method of expression ever tried by the writer succeeds so well as the somewhat tedious and laborious one indicated.

The insoluble residue of this step of the process, when dried at a moderate temperature, varies between 30 and 35 per cent. in well selected opium.

The solution thus obtained, when thoroughly mixed and assayed, yields but a small fraction of one per cent. more of morphia than the solution when finished, whilst the morphia obtained from it is more difficult to purify. This solution may be boiled down as rapidly as it is possible to boil it without loss by splashing, without the slightest injury to the morphia salts, provided the evaporation be not carried beyond the point indicated, and provided the stirring be effectually performed during the last part of the evaporation. The residue is in the form of a thin extract. If this be placed now upon a water bath and evaporated to dryness, it is easily rubbed into a dingy yellowish brown powder, which weighs from 43 to 46 per cent. of the opium.

It is, however, not only unnecessary, but injudicious, to evaporate it to dryness, because the risk of injury to the preparation is greatest during such a proceeding, and at the same time the subsequent exhausting with alcohol is rendered more difficult, while it does not materially increase the proportion of matters rejected by the alcohol. By using a tared tin saucepan, for instance, these steps of the process are conveniently and easily managed.

The first portion of alcohol boiled upon this extract takes up a large proportion of the active matter, and also dissolves a portion of matter which is slowly deposited in cooling. If the time directed be allowed, much of this latter will be deposited upon the vessel in a gummy, adherent coat, so that the tincture may be poured off nearly clear to the last drops, without disturbing it. Any attempt to filter the tinctures is injudicious, because, before the deposition is complete, it would be defeated by clogging of the paper, and after the deposition is complete it would be useless. The residue becomes thicker, blacker, and more tenacious after each boiling with the alcohol, and finally, when exhausted, concretes on cooling into a hard brittle mass, of a dull black color and somewhat granular character, very soluble in water and very bitter. The bottom of the vessel in which the alcoholic solution is collected during this step of the process is also found, after the twenty-four hours directed, covered with a thick stratum of this black matter, whilst the supernatant tincture is by this time perfectly clear. These residues rejected by the alcohol, when collected and dried, weigh about 14 per cent. of the opium, or about 31 per cent. of the dry watery extract. The alcohol may be recovered from the tincture by distillation, if operating with quantities that will warrant it, otherwise it may be driven off by rapid evaporation and boiling till the required weight is obtained. This residue is again in the form of a thin extract, and should be poured while warm into a bottle, because, while warm, less of it will adhere to the evaporating vessel. It is then to be cooled before adding the first portion of ether, and the ether is first washed round the evaporating vessel for the purpose of washing the small portion that adheres to it. The ether commonly becomes only slightly colored, but in the character and amount of matter removed by it varies very much in every instance in which the writer has applied it.

Upon spontaneous evaporation this ether leaves at times only a small portion of dark colored extractive matter, soluble in alcohol and water and of a bitter taste; at other times it yields a crystalline crust upon the vessel; and again it yields an oily matter which dries only by prolonged exposure, or rather by a process of oxidation. Sometimes the residue has that peculiar nauseous odor which is more faintly noticed in the opium, but at other times it is almost free from odor. In perhaps two or three of the six times the writer has used the washing with ether, it has appeared to be of but little use, because the matters removed from it were so very trifling. But in the other cases it was so decidedly useful that it is regarded as an important step toward uniformity of result. For its use in the process the writer is indebted to the suggestion of Prof. Procter, who used it in his formula for a similar preparation, published in this Journal some years ago.

In dissolving the washed extract in water much care is necessary to avoid loss. It should be transferred to a tared vessel capable of holding it when diluted, and all the vessels well rinsed with the water for dilution. Upon dilution a copious light flocculent precipitate of a light brown color is thrown down, which when separated by filtration and dried weighs about 1.2 per cent. of the opium. All these solutions, from first to last, are strongly acid to litmus paper, showing probably that the bimeconate of morphia has suffered no decomposition or loss of its active soluble character, and that the salt is of a very fixed nature.

The writer performed parallel experiments with these solutions, in which a similar part of the same solution was in one case boiled down rapidly over a naked flame, and in the other was evaporated at a low temperature by a vapor bath. An assay of the resulting preparations exhibited no material difference in the morphia strength, while the preparation made by rapid boiling was much less loaded with coloring matter, and had a lighter specific gravity. Other experiments were made wherein the extract was dried and powdered each time, and was in one case repeatedly redissolved and evaporated to dryness, with the view of completely oxidising the resinoid matters to render them insoluble, but it was evident that no advantage was gained. From these experiments, although made with different parcels of the drug, it is easy to get up what may be a useful rational formula for the commercial drug in its best form.

Exhausted residue, not thoroughly dried,	31	per cent.,
Watery extract, " "	43	"
Water,	26	"
	100	

The best specimen of opium the writer has ever examined was the single pound quoted in the table of the preceding paper. It consisted of

Imperfectly dried residue,	30·7	per cent.,
" " aqueous extract,	45·5	"
Water,	23·8	"
	100	

The aqueous extract of this specimen consists of

Imperfectly dried extract insoluble in alchol,	30	per cent.,
" " " in water the second time.	1·2	"
Morphia,	35·8	"
Coloring matter and other constituents soluble both in alcohol and water, and insoluble in ether,	33	"
	100	

It is well known that the natural salts of morphia and one or two of the other alkaloids of opium are soluble both in water and in alcohol, whilst a large proportion of the inert and objectionable matters are rejected by each of these menstrua; and upon these circumstances are based the supposed advantages of this process. The water as a menstruum rejects the resin, lignin, earthy matters, leaves, seeds, &c., and, used cold, rejects almost all the narcotine not combined as a soluble salt, and one or two other constituents in great measure. The alcohol rejects from the watery extract the gum, bassorin, albumen, and some extractive matters, all of which if left in would tend to ferment and change the character of the preparation in keeping, whilst the ether washing removes the oily or fatty matters, some of the codeia and other matters. Thus depurated, and especially when a small proportion of the compound spirit of ether is added, there is no good reason why the preparation should not keep indefinitely.

The application of a process of assay to this preparation, however desirable in view of uniformity of result, has, nevertheless, so many disadvantages in its application to Pharmacy in general, that it is very doubtful whether its use will accomplish the purpose. The practical difficulties in this step are not apparent at sight; for it appears that when reduced to absolute mathematical expression, and when a simple, easy process of management is described in what may seem to be superabundant detail, there could be little possibility of inaccuracy. Yet to any one not practised in such processes, the difficulty of getting the assays to agree in result will be rather surprising and discouraging, and the skill to be acquired before absolute results are attainable will require the exercise of thorough honesty of purpose and industry of pursuit. It is nevertheless absolutely certain, that by perseverance and industry reliable results can be obtained, and that there are a large number of pharmaceutists who by education and experience are well qualified to perform such assays. When using the process for the first time, however, it is not proper for any one to depend upon the result of a single assay as directed in the process. Three, at least, should be made, and the results in two of the three should agree within ·2 of a grain, and the mean of these two should be adopted. Indeed, it will generally be safest to perform two assays, because from the heterogeneous and varying character of opium, the process of morphiometry is rather unusually difficult. The method of assay adopted is not the most accurate one, and always gives results a little too high, though the amount of narcotine coloring matter, &c., weighed as morphia, is nearly counterbalanced by the portion of morphia held by the mother liquor. It is, however, beyond all measure the most simple and the most easy, and most susceptible of a definite practical description, while it is sufficiently accurate to accomplish in great measure the object of uniformity. Through some disturbing influence of the ether and oil of wine the finished solution is much more difficult to assay by the same process. The solution requires to be evaporated at a low temperature for twenty-four hours before the attempt to precipitate it.

The management directed in the assay, by which the alcohol added is divided, and one-half mixed with the ammonia, is necessary in order that the morphia shall be slowly precipitated in the form of dense crystals, and these be tolerably free from coloring matter; and the slowness with which it is deposited makes it necessary that the full time directed be given to this step. Then the morphia is almost all crystallized out, and is in such a form that the mother liquor may be poured off from it generally to the last drop without disturbing the crystals, and thus the complication of a filter is avoided. The capsule used should be shallow, and should not be covered during the time of depositing the morphia, because solutions of ammonia are very variable in strength; and if an excess of ammonia be used within certain limits, it will pass off during twenty-four hours' exposure, and allow the morphia to be deposited more perfectly. The drying and weighing of the contents of the capsule, while still undisturbed within it, is easily performed, and avoids sources of loss and error. The four hundred and sixty-four grains of the solution directed for the assay is exactly one fluid ounce, and the eighty-five parts directed as the standard of dilution for the solution before assaying is exactly equal to eighty parts by measure; that is, eighty-five avoirdupois ounces of the solution measures exactly eighty fluid ounces. One fluid ounce, then, having been taken for assay, leaves seventy-nine fluid ounces or parts by measure. Hence the weight for morphia, obtained by the assay multiplied by 79, gives the whole weight of morphia in the solution; and this whole weight of morphia in the solution divided by 4, gives the number of fluid parts,—parts by measure, —or say, for example, fluid ounces—of four grains of morphia each to which the solution must be finally diluted in finishing it. Now, as a fluid ounce of distilled water weighs 455 grains, (disregarding the fractions,) and as a fluid ounce of the finished solution weighs only 450 grains, it becomes necessary to multiply the number of parts to which the solution is to be reduced or diluted in finishing by 455, and then to divide the product by 450, to get the number of parts by weight to which it must be diluted in the finishing. Then, as 12·5 per cent., or one-eighth of its weight, is the proportion of Hoffman's anodyne fixed upon for the constant quantity, if the last quotient or whole number of parts be divided by 8, this will of course indicate the number of parts by weight of Hoffman's anodyne required.

The finishing is then simply the addition of the 12·5 per cent. of Hoffman's anodyne, and the making up the weight with water. The apparently rather complicated calculation is simple enough when once understood. It is rendered necessary in order that the solution may be made by weight, and be dispensed by measure; and this dispensing by variable and incorrect measures is then the only source of inaccuracy in the practice with it.

When the Hoffman's anodyne is added to the solution, a large part of the heavy oil of wine is precipitated by the abstraction of its solvents. By subsequent digestion and agitation, however, this appears to be in great measure redissolved or combined, so that in one experiment where many weeks were allowed to the frequent shaking, it all disappeared from the surface except just sufficient to form a ring on the bottle at the surface of the liquid. During this digestion and shaking as directed a small portion of very light flocculent matter is precipitated, so that for the removal of this and the small proportion of undissolved oil the ultimate filtration is directed, and a bright, clear liquid is the result.

Each fluid ounce of this solution (weighing 450 grains) contains 4 grains, or very nearly that amount of the pure alkaloid morphia, and probably contains very little of the other active matters of the opium. Four grains of morphia is about equivalent to 5.33 grains of sulphate of morphia, according to the formula $\overline{Mo}\ SO_3+6HO$, for that salt, and therefore each fluid drachm should be equal to ·66, or two-thirds of a grain of sulphate of morphia. Each fluid ounce contains, by actual experiment from an ordinary one ounce vial, 448 to 450 drops, (so that in the case of the solution a drop is very nearly a grain,) and therefore eighty-two drops should be equal to one grain of sulphate of morphia. But in actual practice with the preparation the effect seems to be somewhat less, and has been estimated at one hundred drops for one grain of the best sulphate of morphia. The ordinary sedative dose, where no great amount of pain or irritation is to be combatted, is twenty drops, equal to one-fifth of a grain of the morphia salt. In such doses it sometimes produces tranquillity, and a pleasant calmness and repose, but not sleep. In such cases ten or fifteen drops more finishes or completes the effect when sleep is desirable. In a large class of cases an increase of the proportion of Hoffmann's anodyne appears to be useful.

In comparison with good powdered opium and laudanum it seems to be still further behind them in power, in proportion to the amount of the drug represented and really present in it. If the powdered opium contains, as it should, 10 per cent. of morphia, equal to 12·5 per cent. of sulphate, then 12.5 drops of this solution should represent one grain of the powdered opium. Whilst in actual practice, nearly double that quantity is required to produce the effect in ordinary cases; whilst in such affections as delirium tremens, in one instance two grains of powdered opium succeeded in procuring sleep after one hundred drops of the solution had failed. Indeed it does not appear to be at all adapted to fulfil the indications to the heroic use of opium, and probably the opium is as little adapted to the cases or circumstances to which the solution is most applicable; and the difficulty of producing profound narcotism with this solution in due proportion to the amount of morphia it contains, in comparison with either opium or salts of morphia, is not easy to explain. If this discrepancy be established as a fact upon more numerous and prolonged observations, it will be a curious one in the therapeutic application of the drug.

The preparation has now been in common use nearly four months, and rather extensively used in two of the largest hospitals here; and upon these limited observations the above statements are based,—the observations having been apparently made with care.

New York, Feb., 1860.

CRITICISM ON THE PLURAL OF FORMULA.

Mr. Editor,—My attention has often been attracted, in reading your own and other scientific journals, to the mode of employing the plural of the Latin word Formula, as exhibited in the communications of the different contributors. Most of them designate the plural both in the nominative and objective cases by changing the final a into æ; as, formula, formulæ. For instance, the expressions, "adopted for the formulæ," and "the formulæ are expressed," occur in recent numbers,—the former being in the objective, the latter in the nominative case. The word "formula" is either a Latin word, and to be used as such, or it is an adopted English one, and therefore amenable to the common rules of termination. If we recognize it as belonging to our tongue by adoption, then it must follow the analogies of Greek and Latin words, which lose their original endings, and form the plural by adding an s to the singular, when they are transferred to the English dictionaries. If, on the other hand, it remains a Latin word, it must accord with the Latin grammar. In Ainsworth's Dictionary it is stated to be of the feminine gender, thus making the nominative and accusative cases, plural, to be "formulæ" and "formulas" respectively. Consequently, whenever the word "formulæ" occurs, as if in the objective case, it is incorrect according to both languages, and should be written "formulas."

How much better then to throw off this false Latinity, and adopt formula, at once, as an English word, with a plain, simple, and euphonious termination in s for the plural. We adopt this plan for other words. None of us would say "in four European

Pharmacopœiæ," lest our lingual organs should suffer. I am sure the "formulas" furnished by your journal, will have a good chance for adoption. Respectfully,

MEDICUS.

ON AMERICAN POT AND PEARL ASHES.

By FERDINAND F. MAYER, of New York.

The last number of Wittstein's Vierteljahresschrift (Band ix. 1) contains a paper on adulterated ashes, from D. A. Van Bastelaer, (taken from the *Journal de Pharmacie d'Anvers*, 1859, xv. 172,) which deserves at least a passing notice, as it throws out some serious doubts as to the quality and undisputed superiority of American ashes.

Mr. Van Bastelaer gives the results of an analysis of five different pot and pearl ashes, three of which are of reputed American origin, one Russian, and another of Continental make. They are principally remarkable for the large proportion of *carbonate of soda*, which in the three American specimens stands respectively as 21·14 to 18·76—21·97 to 29·73—15·69 to 28·11 of carbonate and hydrate of potassa, while in the Russian as 11·16 to 36·04.

That this large amount of soda is owing to adulteration when it amounts to one-half of the active ingredients, is not to be doubted. But *where* the falsification takes place, is another question; and I think that the subjoined analysis of ashes, taken indiscriminately out of two leading yards at this port, will prove to some extent that the adulteration was not practised here.

I. *First sort Potash*—the inside of a cask, nearly white and of crystalline texture.

II. *First sort Potash*—the outside of another cask, dark, and contains some sulphuret.

III. *Second sort Potash*—dark grey, with a considerable portion of insoluble matter (carbonate and sulphate of lime.)

IV. *First sort Pearlash.*

V. *Second sort Pearlash.*

VI. *Third sort Pearlash.*

	I.	II.	III.	IV.	V.	VI.
Carbonate of Potassa	43·68	24·57	15·07	56·01[*]	53·15	38·47
Hydrate of Potassa	49·68	44·43	38·69	5·61	4·49	
Sulphate of Potassa	4·07	16·14	19·76	27·70	21·30	53·34[†]
Chloride of Sodium	1·64	4·40	6·60	10·49	5·37	0·62
Carbonate of Soda		4·27	4·70		14·01	6·03
Insoluble matter, etc.	0·72	6·19	15·86	0·19	1·69	1·54

I have not been able to ascertain the origin of No. V., in order to get a clue as to the considerable proportion of soda; but I shall follow up the matter, and probably be able to trace back articles of that description to their place of make.

36 *Beekman St.*, *New York*, Feb. 16, 1860.

NOTE ON KAVAÏNE AND METHYSTICINE.

By the Editor.

The substance which constitutes the subject of this notice is derived from the plant described as Piper methysticum,—the "Cava" of Capt. Cook and the "Kava" of other writers and observers of the productions of the South Sea Islands. The root is both chewed and made into a drink, with a view to its exhilarating effects on the nervous system. The process of making cava as a beverage is described graphically by Mariner in his History of the Tonga Islands, and is quoted by Mr. Morson in a notice published at page 474, vol. 3, of the Pharmaceutical Journal. Recently Dr. S. Weir Mitchell presented us with a specimen marked "Kavaïne" which he had received from Dr. Trist, of the U. S. Navy, who obtained it at Tahiti from a French apothecary at that place, and who had made it from the kava. We were about to make an examination of this substance when the *Journal de Pharmacie* for January, 1860, came to hand, in which M. Gobley has published some researches on the "Kawa" root and its chemical constituents, among which, under the name of *Methysticine*, he describes a crystalline substance which we at first supposed to be the "Kavaïne" of Dr. Trist.

Methysticine is in colorless white and silky needles, has neither odor nor taste nor reaction with litmus, and fuses at 266° F. decomposed at a higher temperature. It is insoluble in water, and but little soluble in alcohol and ether and in hot volatile oils. Its best solvent is boiling alcohol, from which it separates by cooling in crystals. It is soluble in hydrochloric acid with a yellow color. Nitric acid dissolves it with first a yellow and then an orange color without turning red. Pure SO^3 is colored by it beautifully violet, whilst commercial oil of vitriol assumes a deep red coloration.

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[*] Contains 1·5 per cent. of silicic acid.

[†] Contains some sulphate of soda.

M. Gobley at first supposed this substance to be piperin, with which it is analogous; but it differs from piperin, 1st, in its crystalline form; 2d, in its fusing point; 3d, by the reaction of NO^5 and SO^3; and lastly, by its composition, which is as follows:—

Carbon	62·03
Hydrogen	6·10
Nitrogen	1·12
Oxygen	30·75
	100·00

The specimen of Kavaïne from Dr. Mitchell is in beautifully white and brilliant prisms, *soluble* in water, nearly insoluble in alcohol; are insoluble in ether, soluble in concentrated nitric acid without reaction or coloration; soluble in sulphuric acid, and, when heated, the solution acquires a brownish color. It fuses when heated, first losing its transparence, and with further heat yields a voluminous charcoal, and finally an alkaline ash. It is neutral to test papers, has little taste and no odor. From these facts it is evidently a different substance from methysticin, possibly an organic salt. We propose at a leisure moment to examine it more closely.

M. Gobley also isolated from kava a soft resin, which is soluble in alcohol, and remains in the mother liquids, from which methysticine is crystallized. Its color is greenish yellow; its odor aromatic; its taste acrid and biting, and excites salivation. It fuses at 122° F., is insoluble in water and soluble in alcohol and ether, and communicates to SO^3 an intense red color like pepper resin. M. Gobley believes that the physiological effects of kava are attributable to this constituent. Besides these two substances, *cellulose*, *starch*, gum and various salts were found.

Dr. O'Rocke, who sent the kava to M. Gobley, says that it has a decided therapeutic action, and is one of the most powerful sudorifics that he was acquainted with, and also has a direction to the mucous surfaces, as do other varieties of the pepper tribe.

GLEANINGS FROM THE GERMAN JOURNALS.

By Jno. M. Maisch.

Extract. nuc. vom. alc.—When kept in powder, it soon becomes a tough mass. This change may be effectually prevented by adding towards the close of evaporation a little water, and then continue to evaporate to dryness.—*Zippel, in Archiv d. Pharm.*, 1859, July, 24.

Drying upon brick tiles is recommended by Zippel for most precipitates. Hydrated oxide of iron dries in a few hours. White precipitates, like nitrate of bismuth, are obtained of a beautiful whiteness; highly-colored precipitates, however, are rendered paler. A double layer of bibulous paper is recommended to be placed upon the tile. Sulphate and carbonate of soda may be readily exsiccated by hanging them, enclosed in a bag, in a draft of air.

The seeds of Helianthus annuus have been analyzed by A. Kromayer and Prof. Dr. Ludwig, of Jena, who found them to contain,—1. Helianthic acid, $HO, C_{14} H_8 O_7$, a tannin, which is not precipitated by gelatin, but precipitated by sesquisalts of iron with a dark green color: it is not identical with Rochleder's caffeotannic acid of the same formula. 2. Fixed oil, nearly 40 per ct. 3. Fermentable sugar, a small proportion. 4. A body soluble in alcohol, precipitated syrupy by ether, not directly fermentable; on boiling it deoxidizes oxide of copper. 5. Legumin. 6. A body insoluble in water and alcohol, deoxidizing CuO to Cu_2O when boiled with diluted acids (inulin ?). 7. Mulder's horn-like vegetable albumen (resembling cellulose, soluble in conc. SO_3, precipitated by HO). 8. A compound of helianthic acid with a protein-like body. It is a saponaceous mass, swelling up with water, coagulated by acids, soluble in hot alcohol. The authors suppose that most so-called vegetable albumen consists of a protein body combined with a tannic acid (so-called extractive matter.)

9. Cellulose. The seeds yield 4·194 per cent. ashes, consisting of phosphate of potassa, chloride of potassium, phosphate of lime and of magnesia, and minute portions of sulphuric acid. —*Archiv d. Pharm.*, July, 1859, 1–18; Sept., 285–288.

Test for minute quantities of soluble iodides, by C. W. Hempel.—To the liquid contained in a thin, white glass tube, some sesquichloride of iron and sulphuric acid is added until the mixture is colorless. A small portion of starch paste is mixed with it and allowed to settle. The starch assumes a more or less reddish color; ·0000001 iodine in ·5 CC. water still produce a pale rose color. Chloroform may be substituted for the starch; it yields a colored solution if iodine is present. If the iron-salt is replaced by bichloride of platinum, the reaction is still more striking, the chloroform being colored not only by free iodine, but also by finely-divided protiodide of platinum in a finely-divided state. If chloride of palladium is employed, the coloration is occasioned solely by iodide of palladium, which by some agitation readily rises to the surface of the chloroform, there forming a colored stratum. Bichloride of platinum is the best test for iodine in mineral waters, which, on account of the organic matter, had to be acidulated with muriatic acid.—*Ann. d. Chem. and Pharm.* xxix. 260–262, xxxi. 102–110.

Decomposition of urea by nitrites.—Prof. Ludwig and A. Kromayer have found (Archiv d. Pharm. 1859, Oct. 1–11) that nitrite of lead and nitrite of mercury decompose urea in the presence of free nitric acid, not into carbonic acid and nitrogen, as has been asserted by Millon and Neubauer, but into carbonic acid, nitrogen and ammonia, as follows:—$C_2\,H_4\,N_2\,O_2+NO_3+HO,\,NO_5=C_2\,O_4+2N+NH_4O,\,NO_5+HO$. Liebig and Wœhler obtained these results as early as 1838.

Determination of nicotia in tobacco.—Schiel proposes in Ann. der Chem. and Pharm., xxix. 257, 258, the following apparatus: Two strong, narrow-mouthed bottles are connected by a glass tube, reaching in one to the bottom, where it is covered with some linen acting as a strainer; in the other, just below the cork. The first bottle contains the cut tobacco, which is macerated with ammoniacal ether. The corks are secured with string. When sufficiently macerated, the first bottle is immersed in warm, the second in cold water, whereby the vapor of the ether forces the ethereal solution of nicotia into the second bottle. By changing the bottles, the ether distils back into the first bottle, leaving nicotia behind. This process is repeated until the tobacco is exhausted.

ON A NEW TEST FOR VEGETABLE ALKALOIDS.

By F. Schulze, of Rostock.

The acid mixture, obtained by dropping pentachloride of antimony into a solution of phosphoric acid, yields precipitates with ammonia and most of the alkaloids, and may be regarded as a new and reliable test for these organic compounds. Most of the precipitates are of a whitish color; a few, however, are decidedly colored and characteristic in this respect. A solution of one part of muriate of brucia, dissolved in 1000 parts of water, is precipitated by a few drops of the above test liquid with a beautiful rose color. The precipitate dissolves on heating, but separates again on cooling more bulky than before, and the liquid has now an intense carmine color. Dissolved in 10,000 parts of water, brucia yields a little flesh-colored precipitate, which increases in bulk after boiling. The coloration is of great stability.

The author promises further researches on the composition and properties of the precipitates, and the applicability of the test for forensic analyses. The following embraces his observations on the delicacy of the reagent:—

Strychnia: 1-1000th nitrate of strychnia, yellowish-white, curdy; 1-5000th whitish flocculent; 1-25000th slight turbidity.

Quinia: 1-1000th flocculent, somewhat lighter than strychnia; 1-5000th opalescent turbidity.

Cinchonia: 1-1000th bluish-white floccules; 1-5000th very faint turbidity.

Veratria: 1-1000th dirty-white floccules; 1-5000th opalescent turbid.

Narcotina: 1-1000th considerable yellowish-white flocculent precipitate; 1-5000th strong turbidity; 1-25000th slightly turbid.

Morphia: no reaction in solution of 1000 parts of water.

Codeina: 1-1000th strongly turbid, dirty white.

Nicotina: 1-250th slightly turbid.

Piperina: yellow precipitate, even when pretty largely diluted.

Atropia: 1-1000th white precipitate, which, when heated, at first dissolves in the liquid, but separates and increases on continued boiling, and is then insoluble in much water; 1-5000th slight turbidity, increasing by continued boiling.

Aconitia: 1-1000th white precipitate; 1-5000th strong turbidity; 1-25000th slight opalescence.

Caffeina: 1-000th no reaction.

Theobromina: 1-1000th slightly turbid.

Digitalin: 1-1000th turbidity, disappearing on boiling, but reappearing on continuing the heat, when a considerable precipitate is thrown down.

It appears that for most alkaloids Sonnenschein's phosphor molybdic acid is a more delicate test; but it is surpassed in some instances, like atropia, &c., by Schulze's new reagent.—*Ann. d. Chem. and Pharm.* cix. 177. *Buchner's N. Repert.*, 1859, 421–423. J. M. M.

CHEMICAL RESEARCHES ON THE ESSENTIAL OIL OF VALERIAN.

By M. Pierlot, Pharmacien.*

In a note presented to the Academy of Sciences, the author had already demonstrated the pre-existence of valerianic acid in fresh valerian root, and had shown the uselessness of the means recommended for developing it in the oil extracted from the plant. He has since examined the oil to discover what principles it contains, and to establish by new experiments that not one of them is capable of becoming transformed into valerianic acid.

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* Pharmaceutists long ago found out an easier and cheaper way of making valerianic acid than distilling it from the root; but the other products have an interest, especially as one has been recommended for admission to our already encumbered *Materia Medica.*—Ed. Chem. News.

The oil of valerian has been made the subject of investigation by several chemists. Among others, Grote, who discovered valerianic acid; Ettling and Kraps, who supposed it to have the same composition as oil of turpentine; Gerhardt and Cahours, who detected in it an oxygenated oil and a hydrocarbon. Lastly, in the seventh volume of the *Annales de Chimie et de Physique*, 1843, Gerhardt published an important article on the subject, and his conclusions have been generally adopted in all recent works on chemistry. In this remarkable work, the author points out some capital errors.

As well as the acid, some chemists have denied the pre-existence of the oil in the plant. According to the partisans of this opinion, the oil is formed secondarily in the same way as oil of bitter almonds. Some experimenters allowing the free access of air, evidently could not obtain the volatile principle. M. Bouchardat having distilled the tincture of the dried root, found neither oil nor acid. The root exhausted by alcohol, treated again with water, and again distilled, furnished none; and hence the learned professor concluded that, as these principles had not passed over with the alcohol in which they were soluble, and could not be found in the water, they did not exist in the plant.

The fallacy of the first experiment is seen at once. Alcohol is entirely evaporated at 78° C., while the acid in solution requires 110°, and the oil 120° degrees; and therefore the alcohol passes over leaving these bodies in the residue, where they must be sought for.

That the oil does pre-exist in the plant is proved by the following experiments:—

If one of the radicles is simply crushed on a piece of white bibulous paper, an oily spot is produced.

The distillation of the fresh root with water gives an oil varying in color, according to the sort of plant used. It is green when obtained from the wild valerian, and yellow when got from the cultivated plant. From whichever obtained, however, its characters do not sensibly differ in other respects. It is very fluid, and gives off a strong penetrating odor like that of the root; its taste is disagreeable, and a little sour; its specific gravity at 10° C.=0·936. It reddens litmus paper strongly. Exposure to the air removes the greater part of its hydro-carbon, and some of the valerianic acid and water it contains; at the same time the oxygenated oil thickens and is converted into a green resin.

The oil boils at 200° C. A temperature of —40° does not congeal it; but about —150° white flocculi form, and rise to the surface, which, when removed, change to an oily liquid, having the odor of valerianic acid, of which the flocculi are composed.

The oil of valerian does not combine with either caustic potassa or soda.

Cold nitric acid colors it blue; if the mixture be slightly heated, nitrous vapors are disengaged, and at the same time the oil is changed into a blue resin, which is heavier than water, soluble in ether, insoluble in alcohol and caustic potassa, agreeing in these respects with the resin obtained by distilling the oil, and that extracted from the dried root.

When submitted to a simple distillation, the fresh oil gives at from 120° to 200° C. a yellow, oily, limpid, transparent liquid, which is only the oil a little impaired by the operation. This product contains nearly all the acid of the oil; its color becomes deeper by keeping.

If the heat be raised to from 200° to 300°, a limpid transparent oil of a bottle-green color is obtained, which is sensibly acid. Exposure to the air, as well as excessive distillations, transforms it into a green resin; nitric acid, on the contrary, converts it into a blue resin.

If, after removing the product of this second fractionation, the heat be continued to from 300° to 400°, a thick, oily, opaque substance of a greenish color passes over, containing traces of acid. This is completely changed into resin of valerian by the action of nitric acid.

The two last products, green and blue, mixed and distilled together, give between 200° and 280°, a very fluid, transparent, slightly green, oily body, smelling like hay or the camphor of the labiateæ: this is the *valerol* of Gerhardt. It contains still a little acid. Redistillation renders it colorless, and makes the odor softer and sweeter. Gerhardt calls this *neutral rectified valerol.* It is important to remark that it can only be really rectified by distilling it in contact with a strong base, which will remove the acid it always contains. In this way only we obtain a neutral product which no influence will change into valerianic acid.

During the last distillation, between 200° and 280°, there condenses in the retort tube a crystalline volatile matter smelling like camphor: this is the steareoptene of valerian to which we shall presently return.

Such are the different bodies obtained from the oil, simply by means of heat, and we see that valerianic acid is always present, and is found even in the last products of decomposition.

If now we distil the freshly prepared oil off solid potassa, in a tubulated retort furnished with a thermometer, gradually increasing the heat up to 200°, there passes an almost colorless oil, which smells something like oil of turpentine. At 200° the distillation stops spontaneously. Some aqueous vapor is disengaged, and the oxygenated oil retained by the potassa concretes, and assumes an odor like camphor. The result of this first distillation is the hydrocarbon ($C_{20}H_{16}$) contained in the oil. In this operation, which I have often repeated, I have never observed the crystalline matter which Gerhardt sometimes met with; it is only above 210° and at the expense of the oxygenated oil that this body is produced, as we shall see further on. Gerhardt gave the name *borneene* to the hydrocarbon, but I prefer to call it *valerene.* When it is pure it boils at 160°, and evaporates without leaving a residue.

The valerianic acid originally contained in the oil is combined with the potassa; but the oxygenated oil has by no means produced it, as Gerhardt wishes to show.

If now, after having changed the receiver, we continue to heat the oil which was solidified on the potassa, it gradually liquefies, and begins to distil at 210°; boiling directly that temperature is reached. At 280° the distillation stops again, and we have in the receiver a thickish, slightly colored, neutral oil, containing an abundance of solid camphreous matter, which gives it a strong smell like hay. This oxygenated oil is the *valerol.*

Exposure to air thickens and resinifies it, but, contrary to the assertion of Gerhardt, does not develop any acid. It is the same with other oxidising agents, such as bichromate of potassa and binoxide of manganese, the influence of neither producing any reaction on litmus.

Valerol absorbs a good deal of ammoniacal gas without forming a salt, another proof that it does not contain the acid. It continues to boil from 210° to 430°, showing that it has no fixed boiling point.

The stearoptene of valerian ($C_{24}H_{20}O_2$)—the crystalline camphreous matter which we have found in the valerol—condenses in great abundance in the neck of the retort. At the same time a little water is disengaged, most likely from that part of the valerol which is resinified. There remain in the retort a green resin ($C_2 H_{20}O$) and some valerianate of potassa, but I have never found this salt in the residue of the rectification of *valerol* over potassa. In the latter case no oxidising agent can produce any other than the elements we have mentioned, viz. the steareoptene of valerian, resin, and water. MM. Gerhardt and Cahours are, therefore, in error when they say that valerol becomes changed into valerianic acid.

The foregoing may be considered as an exact analysis of oil of valerian, 100 parts of which contain:—

Valerene			25
Valerianic-acid			5
Valerol	Steareoptene of valerian	18	70
	Resin	47	
	Water	5	
			100

The preceding facts, I believe, prove: 1. That the essential oil *does* pre-exist in the fresh plant; 2. That, fresh or old, it always contains about 5 hundredths of valerianic acid; 3. That rectified over potassa it is perfectly neutral; 4. That it contains two oils: the one a hydrocarbon ($C_{20}H_{16}$) or *valerene,* which is neutral, and volatilises entirely, leaving no residue; the other oxygenated or *valerol* ($C_{24}H_{20}O_{2}$), also neutral, becoming resinified in the air and by the action of nitric acid, and decomposing into several bodies; 5. That the valerol is composed of the steareoptene of valerian, resin, and water; 6. That valerol cannot be changed into an acid by any (known) process.—*Annales de Chimie et de Physique, from Chem. News, Dec.* 24, 1859.

CHINOVINE.

The matter extracted from the cinchona barks, and known variously as chinovic acid, red cinchonic, cinchonic bitter, has been made the subject of a long investigation by H. Hlasiwetz and Dr. von Gilm. They have decided that it is a glucoside having the composition $C_{60}H_{48}O_{16}$. In an alcoholic solution, under the influence of chlorine, this breaks up into a sugar which the authors consider identical with the mannitane of Berthelot, and an acid which they call chinovic acid, a change explained thus:—

$$\underbrace{C_{60}\,H_{48}\,O_{16}}_{\text{Chinovine.}}+2\,HO=\underbrace{C_{48}\,A_{38}\,O_{8}}_{\text{Chinovic acid.}}+\underbrace{C_{12}\,H_{12}\,O_{10}}_{\text{Mannitane.}}$$

The acid falls as a crystalline powder. Those crystals are washed with weak alcohol, and then dissolved in strong boiling alcohol, from which they crystallise. The crystals appear to be regular six-sided prisms. They are insoluble in water, only slightly so in ether, but more soluble in boiling alcohol. They dissolve freely in ammonia and the fixed alkalis. All the solutions are bitter. The mineral acids displace the chinovic acid from its combinations, the acid separating as a gelatinous mass.

It is feebly monobasic, and decomposes the alkaline carbonates. The salts of potash and soda are uncrystallisable. Those of baryta, strontia, and lime, prepared by double decomposition, fall as gelatinous precipitates soluble in an excess of water. The chinovate of silver falls as a voluminous precipitate which is very sensible to light. Nitric and sulphuric acids have no action on chinovic acid.—*Chem. Central Blatt*, No. 52.—*Chem. News*, *Dec.* 17, 1859.

PURE BENZOLE FROM COAL-NAPHTHA.

By A. H. Church.

The sulphite of phenyle and ammonium $C_{12}H_5$, NH_4, $2\,SO_3$ usually called sulphobenzolate of ammonium yields a very large proportion of pure benzole when submitted to dry distillation. The hydrocarbon thus procured can hardly be distinguished from the benzole obtained by heating benzoic acid with lime. Its odor is ethereal, almost fragrant; and its boiling-point is constant at 80°·8. A chemist well acquainted with the ordinary benzole obtained from coal-naphtha, to whom I showed a specimen of the benzole thus prepared from the sulphobenzolate of ammonium, scarcely recognised it as the same substance, so pleasant was its odor.

To prepare the sulphobenzolate, the purified benzole of commerce is dissolved, with the aid of a gentle heat, in a slight excess of fuming sulphuric acid; if ordinary oil of vitriol be employed, a much larger quantity of the acid is required. The acid liquid, after having been heated in the water-bath for some time, is allowed to cool, and then diluted with water. Commercial carbonate of ammonium, together with some ammonia water, is to be added till the solution is slightly alkaline. The whole is now evaporated to dryness on the water-bath, and the dry mass exhausted with boiling alcohol. The greater part of the sulphate of ammonium remains in the residue. The alcoholic solution of the sulphobenzolate of ammonium is to be transferred to a retort, and submitted to distillation. When all the alcohol has distilled over, the receiver is changed, and the heat raised. The benzole which collects in the receiver is accompanied by small quantities of solid products and by water. From these it may be separated by the addition of a strong potash-solution, and the removal of the supernatant oil by the pipette. The benzole is then rectified off caustic potash. The benzole thus produced is perfectly pure; and although the quantity obtained is not very large yet the result of the process is exceedingly interesting to the chemist, since it removes all doubt concerning the identity of the benzole from coal-naphtha and similar sources with that obtained from benzoic acid.—*Chem. News*, *Dec.* 31, 1859.

ANALYSIS OF TOKAY WINE.

By Dr. Ziurek.

The quantitative analysis gave the following results:—

One hundred grammes of a pure sample of this wine contain,

Absolute alcohol, - - -	9.108 grms.
Œnanthic ether (imponderable,)	
Grape sugar, - - - -	11.031
Œnanthin (gum,) - - -	4.137
Fatty matter, - - - -	0.007
Albuminous matter, - - -	0.113
Tannin, - - - - -	0.311
Extractive, - - - -	1.378
Acetic acid, - - - -	0.032
Tartaric and uvic acids, - -	0.211
Bitartrate of potassa, - -	0.238
Tartrate of lime, - - -	0.113
Phosphate of magnesia and lime, -	0.265
Sesquioxide of iron, - - -	0.113
Alumina and silica, - - -	traces.
Water, - - - - -	72.900
	99.957

Archiv. d. Pharm., 1859, Novb. 155, 156. J. M. M.

ON THE SPECIFIC GRAVITY OF WATER AT DIFFERENT TEMPERATURES.

By W. H. Pile, Philadelphia.

As a small contribution to science, I present to the Association the following tables on the specific gravity of water at different temperatures, collected from various sources, and comprising my own observations on the same subject.

By way of introduction, I may state that it has been a matter of necessity with me to have a table of this kind, in order to graduate my specific gravity bottles at any temperature, without the trouble and uncertainty of reducing the water to 60° F. artificially, which, in very warm weather, would vitiate the results, by the deposit of moisture on the outside of the glass bottle, as well as from the rise of temperature during the process of weighing.

Having examined and compared together several tables by different authors, I was struck by the discrepancy between them; so much so that I thought it better to construct a table for myself, particularly as my object was merely to ascertain the weight of a 1000-grain bottle, filled with pure water at different temperatures, without taking into consideration the expansion of the glass bottle.

The experiments were made throughout the year, at the varying temperatures of the season, ranging from 50° to 96°, and comprise a large number of observations. These were finally collected together, averaged and arranged.

In order to compare my experiments with the others, I have corrected the results which I obtained, by allowing for the expansion of the glass bottle.

According to Lavoisier and Laplace, flint glass expands for each degree of Fahrenheit $\frac{1}{224640}$ of its length. By the necessary calculation it will be found that its cubical dilation will be such that a bottle containing 1000 grains of water at 60° F., will contain nearly ·013 grains more for each degree above that temperature. Therefore, to obtain the true specific gravity of water from its weight, as observed in the bottle, it is only necessary to subtract ·013 grains for each degree above 60° F., and to add that quantity for temperatures below 60°.

I may also observe that the discrepancies between the tables are much more apparent when water is assumed to weigh 1000 at its greatest density (about 40° F.) than when it is reckoned to weigh 1000 at 60°, as in the annexed tables; in the former case, the variation commencing 20° lower in the scale.

The tables which I have collected, have all been calculated and reduced to the same standard, viz.: water at 60° F. = 1000. This has occupied considerable time, from the fact that the original observations are reckoned from different points, and with different thermometric scales.

Thus in Kopp's table of the expansibility of water, the specific gravity of the water was first calculated from its observed expansion; next, the results were reduced from Centigrade to Fahrenheit's scale; and lastly, as Kopp assumes water at 32°

F. to equal 1000, the results were again reduced, so that water at 60° should equal 1000.

TABLE No. 1.—Reduced from Kopp's table as above stated. (Vol i. of the Cavendish Society's Works.)

TABLE No. 2.—Tralles' table for every 5°, the intervening degrees being interpolated: Water at 40° = 1000. (Ure's Dictionary, Art. Alcohol.)

TABLE No. 3.—Hallstrom's table for every 9°: Water at 39.38 = 1000. (Booth's Cyc. of Chem.)

TABLE No. 4.—Despretz's table of the expansibility of water: Water at 4° C. (39.2° F.) = 1000. (Journal de Chim. et de Phys., vol. lxx., 1837.) Contained in a very able and lengthy paper, giving all the details of the numerous experiments on the subject.

TABLE No. 5.—Hassler's observations, collated and reduced by J. H. Alexander: Water at 40° = 1000. (Silliman's Journal, vol. xvi., 1853.) These experiments were originally published in a congressional document (1832) in a report on the comparison of weights and measures, and are stated to have been made on a very large scale.

TABLE No. 6.—My own observations, corrected for the expansion of the glass bottle, as previously remarked.

Temp. Fahr.	1 Kopp.	2 Tralles.	3 Hallstrom.	4 Despretz.	5 Hassler.	6 W. H. Pile.
32°	1000.78	1000.80	1000.69			
33°	1000.80	1000.83	1000.71			
34°	1000.83	1000.85	1000.73			
35°	1000.85	1000.87	1000.75			
36°	1000.87	1000.88	1000.77			
37°	1000.88	1000.88	1000.78			
38°	1000.89	1000.89	1000.79			
39°	1000.89	1000.89	1000.80	1000.95		
40°	1000.90	1000.90	1000.80	1000.95	1000.63	
41°	1000.89	1000.89	1000.80	1000.94	1000.63	
42°	1000.88	1000.89	1000.79	1000.94	1000.63	
43°	1000.87	1000.88	1000.78	1000.93	1000.63	
44°	1000.85	1000.88	1000.77	1000.91	1000.62	
45°	1000.83	1000.87	1000.75	1000.88	1000.61	
46°	1000.80	1000.85	1000.73	1000.85	1000.59	
47°	1000.77	1000.83	1000.70	1000.82	1000.57	
48°	1000.73	1000.80	1000.66	1000.78	1000.55	
49°	1000.69	1000.76	1000.62	1000.74	1000.52	
50°	1000.65	1000.70	1000.58	1000.69	1000.49	1000.67

Temp. Fahr.	1 Kopp.	2 Tralles.	3 Hallstrom.	4 Despretz.	5 Hassler.	6 W. H. Pile.
51°	1000.60	1000.65	1000.54	1000.64	1000.46	1000.62
52°	1000·55	1000.59	1000.49	1000.59	1000.42	1000.56
53°	1000.50	1000.53	1000 44	1000.53	1000.38	1000.50
54°	1000.44	1000.46	1000.39	1000.46	1000.34	1000.44
55°	1000.37	1000.39	1000.33	1000.39	1000.29	1000.37
56°	1000.31	1000.32	1000.27	1000.32	1000.24	1000.30
57°	1000.24	1000.25	1000.21	1000.25	1000.18	1000.23
58°	1000.16	1000.17	1000.14	1000.17	1000.13	1000.16
59°	1000.08	1000.09	1000.07	1000.09	1000.06	1000.08
60°	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
61°	999.91	999.91	999.93	999.91	999.93	999.91
62°	999.82	999.82	999.85	999.81	999.86	999.82
63°	999.73	999.72	999.76	999.71	999.78	999.72
64°	999.63	999.62	999.67	999.60	999.70	999.62
65°	999.53	999.51	999.57	999.49	999.63	999.53
66°	999.43	999.40	999·47	999.38	999.53	999.43
67°	999.32	999.29	999.36	999.27	999.44	999.33
68°	999.21	999.17	999.25	999.17	999.35	999.23
69°	999.10	999.05	999.14	999.06	999.26	999.12
70°	998.98	998.93	999.03	998.95	999.16	999.01
71°	998.86	998.81	998.91	998.84	999.05	998.90
72°	998.73	998.69	998.79	998.72	998.95	998.78
73°	998.60	998.56	998.67	998.60	998.84	998.66
74°	998.48	998.43	998.55	998.47	998.72	998.53
75°	998.34	998.30	998.42	998.34	998.60	998.40
76°	998.21	998.17	998.29	998.20	998.48	998.27
77°	998.07	998.04	998.16	998.06	998.36	998.13
78°	997.93	997.90	998.02	997.91	998.23	997.99
79°	997.79	997.76	997.88	997.76	998.10	997.83
80°	997.65	997.61	997.74	997.61	997.96	997.68
81°	997.50	997.46	997.59	997.45	997.82	997.52
82°	997.35	997.31	997.44	997.29	997.68	997.35
83°	997.20	997.16	997.28	997.13	997.54	997.18
84°	997.05	997.01	997.16	996.97	997.39	997.01
85°	996 89	996.85	996.96	996.81	997.23	996.83
86°	096.73	996.69	996.79	996.65		996.64
87°	996.57	996.53		996.48		996.46
88°	996.40	996.36		996.31		
89°	996.23	996.19		996.14		
90°	996.05	996.01		995.97		

Note by the Editor:—In the Proceedings of the American Pharmaceutical Association, for 1859, in which the above tables originally appeared; by an unfortunate transposition of the types, the specific gravity of water in all the columns for 60° was placed at the top of the page opposite 51°. Consequently all the other lines of figures, from the 51° to the 59° inclusive, were misplaced one line too low down. We have corrected these errors in our reprint, also filled up the blanks, previous to the periods, left vacant in the original.

REMARKS ON POLYGALIC ACID.

By William Procter, Jr.

Among the questions proposed last year for investigation, the following was accepted by me :—

"What is the most eligible process for obtaining Polygalic acid from Senega? In what proportion does it exist in that root? And what are the forms for prescribing it as substitutes for the preparations of seneka?

Seneka snake root, as one of the most efficient American contributions to the Materia Medica, early attracted the attention of European pharmaceutists and chemists, and at least half a dozen analyses of it had been published more than twenty years ago, when it was very fully investigated by Quevenne, (Jour. de Pharm., 1836, 449) in his inaugural essay sustained at the School of Pharmacy, at Paris.

According to this analysis the constituents of seneka are as follows, viz. :—

ORGANIC.

- Polygalic acid,
- Virgineic acid,
- Pectic acid,
- Tannic acid,
- Bitter yellow coloring matter,
- Gum, Albumen, &c.,
- Cerin, and fixed oil.

INORGANIC.

- Carbonate, Phosphate and Sulphate of Potassa,
- Chloride of Potassium,
- Carbonate, Sulphate, and Phosphate of Lime,
- Alumina, Magnesia, Silica, and Iron.

Polygalic acid, so called by Quevenne, was previously made known in a less pure state, as *senegin*, by Gehlin. It is the active constituent of the root, although some influence may be due to the virgineic acid and coloring principle. It may also be noticed that both Dulong and Foenuille found malic acid in this root, united with lime and potassa.

It may not be out of place to state the characteristics of this substance, as it is certainly deserving of a better destiny than has thus far been accorded to it. Polygalic acid is a white amorphous powder, without any tendency to crystallize, and is unalterable in the air. It is inodorous when pure, but is apt to retain traces of virgineic acid. Its taste, at first but slight, soon becomes pungent and acrid, and produces a painful constriction of the throat. When its dust is inhaled through the nostrils, irritation and violent sneezing occur. It is not volatile; when burnt in a tube it affords no nitrogen, and is wholly combustible. Polygalic dissolves slowly in cold water, but readily in hot water, forming a solution which reddens litmus paper, and froths strongly by agitation. It is soluble in boiling alcohol, but the larger part separates on cooling. It is soluble in diluted alcohol, but the solution has a tendency to deposit it on standing. It is absolutely insoluble in ether, and in acetic ether, the fixed and volatile oils. It is soluble in alkaline solutions, with the production of a greenish yellow coloration. It is precipitated in its free state by subacetate of lead, and proto nitrate of mercury, but by no other salts; various salts throw it down from solution when it is combined with an excess of potassa or soda. When heated with nitric acid it affords oxalic and picric acids, and sulphuric acid decomposes it with a rose and violet color. The acid character of this substance is so slight that it will not decompose the carbonates, yet it forms amorphous salts with alkaline and metallic bases. Quevenne suspected a close relationship between polygalic acid and saponin. More recently (Annl. der Chemie, and Amer. Jour. Pharm. vol. xxvii., 43) M. Bolley has resumed the inquiry, and believes that both saponin and polygalic acid are glucosides, like salicin, resolved by hydrochloric acid, into sugar and a derivative body *sapogenin*, and that their formula is the same.

Preparation of Polygalic Acid. The particular object of this paper is the preparation and administration of this substance. The original process of Quevenne required precipitation by acetate of lead, and the action of sulphuretted hydrogen; but he afterwards greatly simplified the process, but retained some complications not necessary to obtain the acid sufficiently pure for medicinal use. The following process I have tried several times, and it has the merit of great simplicity.

Take of Senega, in powder, (50 meshes to the inch) 10000 grs.
Alcohol,
Ether, and water, each, a sufficient quantity.

Moisten the senega with half a pint of a mixture of two parts of alcohol and one part of water, pack it in a large glass funnel; cover the surface with a piece of muslin, or paper, and pour on the same liquid until three pints have slowly passed by drops, or until the root is nearly exhausted. Evaporate this tincture to twelve fluid ounces, which removes nearly the whole of the alcohol, and then agitate it with repeated portions of ether, until the latter ceases to acquire color, decanting each portion before adding the next, which requires about a pint and a half. The syrupy liquid is now mixed with a pint and a half of strong alcohol, and a half a pint of ether, well agitated several times and set aside to repose. The polygalic acid being nearly insoluble in this menstruum, precipitates as a bulky light fawn-colored precipitate. If on adding a small portion of the clear liquid to a similar mixture of ether and alcohol, no precipitate occurs, the whole of the polygalic acid capable of being thus thrown down has been separated. The supernatant liquid is now carefully decanted from the precipitate, which is thrown on to a filter and carefully washed with a mixture of two parts of alcohol and one of ether, till the adhering colored liquid has all been displaced. The filter is then spread on an absorbent surface of paper, pressed strongly, the mass broken into small fragments, dried, and powdered. The resulting powder weighs 550 grains, 5½ per cent. of the weight of the senega; making allowance for wastage, senega may be said to contain one-sixteenth of its weight of this substance, and consequently thirty grains will equal an ounce of the root.

In this state polygalic acid is not pure, but is sufficiently so for all medical purposes. It retains traces of coloring matter, and of some substances which are separated by the ether, but in very small amount. By re-dissolving it in hot water, and precipitating with the mixture of ether and alcohol, and afterwards dissolving it in hot alcohol, with animal charcoal, and filtering hot, it is obtained quite white.

The ethereal washing liquids first obtained were evaporated till no ether remained. The residue consisted of a dark amber-colored fixed oil, admixed with crystals of virgineic acid, which formed a crust on its surface, and a dense aqueous solution of the same acid, which strongly affected litmus paper.

The liquid from which the polygalic acid precipitated was allowed to stand a month, when the sides and bottom of the vessel were spangled with a crystalline matter, in small quantity.

This substance is soluble in water, when heated; less soluble in alcohol; gritty between the teeth; has no taste of senega; fuses by heat, blackens, and is almost entirely consumed. Concentrated SO^3 dissolves it with heat without the evolution of either ammonia or HCl. Its aqueous solution is not precipitated by either chloride of barium or nitrate of silver. A crystal placed on moistened litmus paper produced a reddish spot. It is possible that this substance is an acid salt of malic or some analogous acid. The small quantity of ash it leaves is alkaline. The investigation was not pushed further.

The liquid, from which the crystals deposited, by evaporation yielded an extract tasting strongly of senega.

As regards the pharmaceutical applications of polygalic acid, several experiments were made:—

1. Five grains of the acid in a fluid ounce of water, kept in a vial for two months, acquired a fœtid odor, whilst a portion of matter precipitated, yet the taste of the solution was strongly that of senega.

2. Five grains of the acid were dissolved in an ounce of cold water, with five grains of bi-carbonate of potassa, and kept the same length of time. This solution also spoiled, but retained its senega taste.

The best form of prescribing polygalic acid, in liquid form, is with syrup of gum arabic, to blunt its acrimony. It is necessary to dissolve it in a little hot water, and add it warm to the syrup of gum, and mix them. It may also be added to syrup of ipecacuanha to increase its expectorant power. But the form best adapted to administer this principle is in pills and powders. In doses of one or two grains (which represent 15 to 30 grains of senega) the full effect of a table spoonful and a fluid ounce of decoction of senega is obtained. Where a more gentle effect is desired, the dose must of course be greatly reduced, to ½ or ¼ of a grain, and can be associated with ipecac, tartar emetic, and other medicine with which senega is given. When the form of powders is adopted, a mixture of powdered gum and sugar should always be added to blunt the acrimony of the polygalic acid. Sugar of milk triturated with the acid, in the proportion of 1 grain to 9 grains, is an eligible form for use.

In cough mixtures, when not contra-indicated or incompatible, the addition of an equal weight of bi-carbonate of potassa facilitates its solution. It is not advisable to keep a permanent liquid preparation of polygalic acid, leaving that form for the officinal syrup, but it undoubtedly offers an admirable means of using senega in the forms above indicated, when the physician can regulate the dose and associate it with other remedies in the nicest manner.—*Proc. Am. Pharm. Association*, 1859.

ON THE DETECTION OF PHOSPHORUS.

By Dr. Fred. Hoffman.

The author has instituted a series of more than one hundred and fifty experiments with Mitscherlich's method for detecting phosphorus. He has mixed the phosphoric mass of matches in different preparations, with food cooked in various ways, with beverages commonly used, and with medicines in a liquid, soft and plastic state, and kept the mixtures for a variable length of time. The presence of phosphorus, it will be remembered, is established by the phosphorescence imparted to the aqueous vapors on distilling the liquid or liquified mixture, and the distillation of the phosphorus is increased by the addition of sulphuric acid, chloride of sodium, sugar, &c., whereby the boiling point is made to approach that of phosphorus.

In the place of Mitscherlich's apparatus, the author has constructed a more simple one, which is easily prepared and readily taken apart. It consists of an ordinary flask, connected with a receiving bottle by means of a glass tube, which passes about eighteen inches through a glass cylinder, filled with cold water. A long, straight tube conducts the gaseous products from the bottle. The lamp and flask are surrounded with dark paper, and about three-fourths of the glass cylinder. The operation is best performed in a dark room.

The phosphorescence of the liquid increases in intensity with the consistence of the liquid and the quantity of the phosphorus. The gas bubbles are luminous, rise in the mixture, and apparently burn upon its surface with a bright flame. With the temperature the light is increased; a photosphere fills the flask, rises in the tube, and moves up and down within the cooled part.

Sometimes only a column or a luminous ring appears stationary at the point where the vapors are cooled, and a luminous fog or sparks gradually sink into the receiver, or a sudden, frequently-repeated lightening is observed. If the heat is raised too high, or the cooling is insufficient, the luminescence passes through the long gas-tube, at the mouth of which the gases take fire, if the volatile oils from cruciferæ (mustard, &c.) have been present.

Coffee, mustard, smoked meat, highly-seasoned food and beverages, and medicines containing odorous gum-resins, volatile oils, musk, castor, camphor, chlorine, &c., have the property of covering the odor of a small portion of phosphorus; minute quantities, which yet produce the symptoms of gastro-enteritis, may not be recognized by the odor in the contents of the stomach. The reaction is not prevented, except by the presence of much alcohol, volatile oils and mustard. If the quantity of phosphorus be not too insignificant, the phosphorescence is observed, either momentary or constant, at the beginning of the distillation, and after the alcohol has passed over.

The reaction is not interfered with by the presence of ipecac., tartar emetic, magnesia, hydrated oxide of iron, musk, castor, opium, albumen, neutral acid, or basic salts and double salts, volatile organic acids, chlorides, iodides and sulphides, and by free acids; but iodine, chloride and bichloride of mercury in considerable proportion, and metallic sulphides in the presence of free sulphuric acid, and particularly oleum cinæ, (artemisiæ,) interfere with or prevent the reaction.

Numerous experiments, by distilling the brain of various animals, blood, albumen, casein, fibrin, legumin and other protein compounds with diluted sulphuric acid, yielded not the least photospheric reaction.—*Archiv. d. Pharm.*, 1859, Oct., 22–26.

J. M. M.

ON CYCLAMIN AND THE TUBER OF CYCLAMEN EUROPÆUM, L.

Dr. T. W. C. Martius has published in Buchner's N. Repert. viii. 388–395, an account of his experience in preparing cyclamin. The author recommends the following method:—Six pounds of the dried tubers, collected in the fall, are reduced to a coarse powder, mixed with two pounds of animal charcoal, digested for twenty-four hours in a still with six gallons of alcohol of at least ·825 spec. grav., then boiled, the distilled alcohol being returned into the still, and expressed while yet warm; the residue is treated in the same manner with 4½ galls. alcohol, and the mixed tinctures, after having been filtered, are distilled until one-fourth is left behind, which residue is set aside for six or eight weeks. The precipitate is then washed upon a filter with alcohol until it passes colorless. The filtrate and the washings are mixed and evaporated to three or four quarts. In a few weeks more cyclamin will have separated; after washing it is added to the portion first obtained. The whole is then mixed with 6 oz. animal charcoal, and treated with 4 pints of boiling alcohol. On standing over night, the filtrate deposits most of the cyclamin; the liquid portion is distilled or evaporated to 6 or 8 oz., and will separate some more cyclamin after several days.

Cyclamin is a white granular powder, uncrystallizable, soluble in alcohol and water. The aqueous solution is fluorescent, and coagulates on boiling, but the coagulum redissolves in the liquid: insoluble in ether, chloroform, glycerin and caustic alkalies. The solutions are neutral to test paper. They are precipitated white by nitrate of silver, acetate and subacetate of lead, and bluish white by sulphate of copper. When boiled with diluted acids, it yields glucose in solution and a white granular precipitate, *cyclamiretin*, insoluble in water and ether, but soluble in alcohol.

According to Dr. Klinger's analysis, cyclamin is composed of $C_{40}\,H_{24}\,O_{20}$; cyclamiretin $= C_{28}\,H_{16}\,O_{12}$.

In the "Zeitsch. der Aerzte zu Wien," Prof. Dr. G. Schroff has published the results of his experiments with cyclamin and the root of Cyclamen Europæum. The following is selected from an abstract of that paper in *Buchner's N. Rep.* viii. 452–459.

Cyclamin is amorphous, white, of a disagreeable acrid taste, persistent in the throat. Its aqueous solution foams like soap water. It coagulates between 60 and 75° C. (140 and 167° F.)

From their experiments De Luca and Bernard came to the conclusion that cyclamin had properties similar to curara. Pelikan thinks it an acrid poison. The following are the most important of Prof. Schroff's results:—

Cyclamin is a poison; it is the most powerful, but not the only active, constituent of the root. The well-dried root may be preserved for several years without losing its efficacy. It is without any influence on the skin. It produces burning, nausea and vomiting, but no inflammation of the mucous membranes of the mouth and stomach. Introduced into the respiratory organs it absorbs hæmatin from the blood, and produces intense inflammations; also hyperinosis. It causes intense inflammations in the rectum, the peritoneum, and when introduced below the skin. It exerts only a passing influence on the cerebro-spinal system, when introduced directly into the circulation. Its action is directed towards the salivary glands. After being absorbed it probably alters the composition of the blood; it is uncertain yet in what state and by which organs it is excreted. In its properties it is similar and stronger than smilacin, senegin and saponin; gastritis excepted, it also resembles emetia, colocynthin, elaterin and colchicia, but is weaker. It differs essentially from the narcotic and acrid-narcotic poisons.

The juice of the root of Cyclamen Europæum has only the properties of cyclamin. The quality of the action of the fresh root is the same as of the dried tuber, but in quantity it is less, being one-third of the latter. The alcoholic extract has the same qualitative properties, but is double the strength of the dried root. The aqueous extract is almost inert; a boiling temperature injures the activity. Besides the symptoms produced by cyclamin, the root and alcoholic extract cause gastritis.

Cyclamen is a fish-poison; its juice, coming into contact with their respiratory organs, forces the fishes to seek the surface of the water, and ultimately kills them. J. M. M.

ON THE SEAT OF THE VESICATING PRINCIPLE OF LYTTA VITTATA.

By Joseph Leidy, M. D.
Prof. of Anat. in the University of Penn'a.

It often occurred to me that the vesicating principle of the blistering fly, *Cantharis*, *Lytta*, etc., was the product of some special organ in the insect, and was not diffused through the body of the animal. In polyps, bees, wasps, mosquitos, etc., we find the irritating agencies or poisons produced by particular cells and glands, not to mention the poisons and odorous principles found in special organs of higher animals. A few days since, observing numerous individuals of Lytta vittata feeding on Amaranthus albus, I collected a number, and at a leisure moment experimented with the different parts of the animal to ascertain if the vesicating principle was confined to some special part of the insect. I did not then recollect of having read of others who had performed similar experiments with the same object, but on examination, find in Pereira, under the head of Cantharis vesicatoria, the following remarks:

"The active and odorous[1] principles of cantharides reside principally in the sexual organs of the animals. Both Farines and Zier tell us that the soft contain more active matter than the hard parts. It appears, also that the posterior is much more acrid than the anterior portion of the body; and Zier says the ovaries are particularly rich in this active matter."

Though I have long been familiar with the researches of Audouin on the anatomy of the Spanish fly, I remembered that he had made no mention of the source of irritating power in the insect. The anatomy of Lytta vittata is so nearly like that of the Cantharis vesicatoria as described by Audouin, that I shall say nothing about it except in the way of reference. Without examining the work of Farines and Zier, I will detail the results of my experiments on the Lytta vittata, and leave it to others to compare them with the experiments of the former authors.

The Lytta vittata appears not to possess the peculiar mice-like odorous principle of the Cantharis vesicatoria, at least I have not observed it in living or fresh dead specimens, nor in specimens dried and long preserved.

When the Lytta is caught, it exudes a clear yellow liquid, usually in one or two drops, from a corresponding number of the knees, though smaller drops are not unfrequently seen to appear at other joints of the legs. This liquid appears to be the blood of the animal, for it is in all its physicomicroscopical characters like this fluid obtained from any part of the body. If an elytrum is cut across, one or two drops of the same liquid exudes from vessels of the cut margin. The liquid forms a fibrinous coagulum, and contains colorless corpuscles, like the blood of insects ordinarily. The exudation occurring on the capture of the Lytta, I suspect to be the result of voluntary rupture of the parts, which is not extraordinary when we take into consideration the ease with which insects will sacrifice a leg. Be it as it may, the yellow liquid from any part of the body vesicates. Portions voluntarily exuded on the capture of the insect, others from the cut borders of the elytra, from cut extremities of the legs, and from the head, imbibed by separate portions of bibulous paper produced upon the inner side of my forearm a corresponding number of blisters. As the nettle among plants, and the larva of the egger moth have stinging hair, I was led to try those of the Lytta. A quantity scraped from the elytra and other parts were mixed with cerate and applied to my forearm. They proved to be inert.

Half a dozen elytra cut into fragments and mingled with cerate produced a blister. This was the result of the contained yellow liquid or blood, for a nearly entire elytrum vesicated only at the point of contact of the cut border.

The intestinal canal with its leafy contents produced no effect. The muscles of the thorax, and the rete adiposa, or fatty matter common in insects, separately applied to the forearm, produced no effect. The testicle and epididymis of the male likewise were inert; as were also two long tortuous accessory glands of the generative apparatus in the same sex. Two other accessory glands of the generative apparatus in the male, equally long and tortuous with those just indicated, are distended with an opaque white granular matter. This matter, mingled with cerate, was found to be highly vesicant. Viewed with the microscope it seems to be a consistent fat-like substance; appearing as spherules of various sizes with dark outlines, fainter concentric lines, and others radiating. The spherules recalled to mind the appearance of the crystalline lens with its concentric layers and radiating fibres.

The ovary vesicated. The result also was obtained from the isolated eggs, crushed and mingled with cerate. A large pyriform sac attached to the generative apparatus of the female, contains a yellow sebaceous-like matter, together with a mass of hard opaque white substance. The former material appears to consist of spermatic matter, epithelial cells, and an albuminous substance; and it is inert as a vesicant. The mass of hard white substance is composed of the same fat-like spherules above described as existing in accessory glands of the male generative apparatus. I have occasionally observed it to be absent, and suspect that together with the other contents of the pyriform sac it is derived from the male. Mingled with cerate, I found it also to be a vesicant. My friend, Dr. Darrach, also applied portions of the two different substances, from the pyriform sac of the female generative apparatus, to his forearm. The fatty-like spherules alone vesicated.

Thus, as a result of the experiments above briefly detailed, the vesicating principle of Lytta vittata appears to belong to the blood, the peculiar fatty substance of certain accessory glands of the generative apparatus, and to the eggs.—*Am. Journ. Med. Sci. Jan.* 1860.

ON SANTONATE OF PROTOXIDE OF MERCURY, AN EXCELLENT VERMIFUGE.

The solutions of equal parts of protonitrate of mercury and santonate of soda, in distilled water, are mixed; after 24 hours, the precipitate is separated by a filter, well washed with distilled water, dried at a moderate heat, and preserved in bottles excluded from the light.

The protosantonate of mercury is a whitish powder, somewhat crystalline under a magnifier, inodorous, and of a slight metallic taste, which is afterwards bitterish and very persistent. It is insoluble in water and alcohol, unaltered at 212°, charred at a high temperature and decomposed into mercury and red oxide of mercury; lime water decomposes it into soluble santonate of lime and black oxide of mercury.

A solution of sulphide of potassium decomposes it at 212°, forming black sulphide of mercury and soluble santonate of potassa. A warm solution of iodide of potassium yields with it greenish iodide of mercury and santonate of potassa.

Exposed with alcohol to the temperature of boiling water, a turbidity is produced on the addition of water, but no precipitate. Thereby the salt is distinguished from santonin, which under the same circumstances is precipitated. When treated with diluted nitric acid, protonitrate of mercury is dissolved and pure santonin left behind.

Other acids show the same behaviour as nitric acid, and alkalies decompose it like limewater. (From the Italian, by Dr. John Müller of Berlin.—*Arch. d. Pharm. Nov.* 1859, 147–149.)

Note.—The dose of this preparation is not mentioned, and no quantitative analysis appears to have been made. J. M. M.

ON THE SOLUBILITY OF ALKALOIDS, ETC., IN CHLOROFORM.

By A. Schlimpert.

But very little is known of the solubility of alkaloids in chloroform, which behaviour may frequently be employed, for instance in detecting impurities in the more soluble alkaloids, for separating quinia and santonin from their preparations, &c. It likewise appears not impossible that chloroform may be employed, with advantage for the preparation of some alkaloids like atropia, and some others of the more soluble ones.

The alkaloids were first examined for their purity, shaken and digested with chloroform for three hours, at a temperature of 64° F. The solution was filtered at the same temperature, weighed, evaporated, and the residue weighed.

100 parts of chloroform dissolve of

Morphia,	1.66	parts.	Atropia,	33.0	parts.
Acetate of morphia,	1.66	"	Strychnia,	14.1	"
Quinia,	15.—	"	Nitrate of strychnia,	6.6	"
Sulphate of quinia,	0.0	"	Caffeina,	11.—	"
Muriate of quinia,	11.1	"	Digitalin,	1.25	"
Cinchonia,	2.50	"	Brucia,	14.—	"
Sulphate of cinchonia,	3.—	"	Aconitia,	22.—	"
Chinoidin,	25.3	"	Pure santonin,	23.—	"
Veratria,	11.6	"	Santonin,	33.3	"

The last santonin had been colored yellow by sun light; the solution was likewise of a yellow color, but lightened gradually, and was at last colorless. If the chloroform is now evaporated at a very moderate heat, the santonin crystallizes in colorless tablets; if the heat was too high, the solution assumes again a yellowish color, and the santonin is separated with the same color.

Sulphate of quinia being insoluble in chloroform, any sulphate of cinchonia with which it may be coaxaminated, may be separated by that liquid.—*Archiv d. Pharm.* 1859, *Nov.* 151, 152.

J. M. M.

MALAMBO BARK.

The origin of this aromatic bark, which has been a disputed question ever since its introduction to Europe by Bonpland in the year 1814, has at length been satisfactorily determined by Mr. H. Karsten, of Berlin. A residence of twelve years in the northern countries of South America has enabled Mr. Karsten to make many interesting and important observations on the vegetation of that botanically rich region, the result of which observations he is now communicating to the scientific world in a magnificently illustrated work, under the title of *Floræ Columbiæ Terrarumque adjacentium Specimina selecta.* From this work, in which the Malambo tree is beautifully figured, we extract the following description and remarks:—

CROTON MALAMBO Krst. *Euphorbiaceæ* R. Br.

Character differentialis.

Arbor foliis ovalibus, crenato-serratis, glabris basi biet in crenaturis uni-glandulosis.

Character naturalis.

Arbor duodecim vel quindecim-pedalis in littoribus australibus maris caribæi habitans, trunco recto quadripedali, cortice suberoso flavescenti odore camphoreo-aromatico prædito, tecto; cacumine ramoso ellipsoideo; foliis alternis, glabris hircino-odoris glandulis oleiferis, pellucido-punctatis, bistipulatis,—stipulis minutis linearibus, acutissimis, caducis,—longe petiolatis, petiolis 1—2½ pollicaribus, lamina ovali basi rotundatd excisa, subtus utrinque glandulam minutam, patelliformem gerentibus, margine crenato, in crenaturis glandulam illis similem fovente, 4—5 pollices longa 2—2½ pollices lata.—Inflorescentia terminalis racemosa, monoica. Flores bractea minuta, caduca sustentati, feminei inferiores 3—8, longe pedunculati, majores. Calyx campanulatus, quinquepartitus persistens, lobis lanceolato-triangularibus, margine pilosiusculis, æstivatione valvatis. Discus glandulosus hypogynus quinquedentatus; dentes (petala rudimentaria) filiformes, longitudine calycis urceoli, apice pilosi, subpenicillati, cum lobis calycinis alternantes. Ovarium pilis stellatis caducis hirtum, triloculare, loculis uniovulatis; styli tres basi pilorum fasciculo penicillato tecti, bifidi, stigmatosi. Flores masculini superiores plures, breviter pedicellati. Calyx quinquefidus extus pilis stellatis hirtus, lobis triangularibus, æstivatione valvatis. Petala quinque, lobis calycinis alterna, lanceolata, longitudine calycis, hyalina, intus pilosa et margine fimbriata, evanescentia, æstivatione imbricata. Stamina 18--20 disco piliso, decem crenato inserta; filamenta libera, subulata, glabra, per æstivationem erecta; antheræ ovales birimosæ basi affixæ. Pollen globosum granulosum. Ovarii rudimentum nullum. Fructus sub-globosus 3'''--4''' in diametro, stylorum residuis coronatus, lævis, glaber, capsularis, tricoccus, coccis monospermis; seminis haud maturi) testa flavescens. Floret Majo.

The preceding species is distinguished from every other of the genus *Croton* (as we find from Baillon's recent labors on this family) by the 10-sided glandular ring of the male flower and the position of the stamens in the bud, which while in this state are not incurved, as is usual in the genus, but stand perfectly erect. To found a generic division, however, upon these characters appears unnecessary. To the sub-genus *Eucroton* (Baillon, *Etude générale des Euphorbiacés*, 1858) *C. Malambo* is in close proximity. From the very few species with glabrous leaves with which *C. Malambo* may be compared, the latter is distinguished by its *oval* leaves from *C. castaneifolium* L. (*Sp. Pl.*, ed. 1), which has *lanceolate* leaves; and from *C. ovalifolium* Wild. and *C. microphyllum* Lom. by its branches being glabrous and not hairy.

Croton Malambo grows in the neighborhood of the Caribbean Sea on the north coast of Venezuela and New Granada, in the former of which countries it is known by the names of *Torco* or *Palo Mathias*, and in the latter by that of *Malambo*. In New Granada, especially, it is of very frequent occurrence in the country laying between Rio Hacha and Carthagena, where sometimes in the low forests of the coast it prevails to a vast extent. Its stem, which grows to a height of four feet, is covered with a yellowish-white, rough, externally somewhat corky bark, which possesses a very aromatic odor resembling that of *Calamus aromaticus*. The leaves have, when bruised, a peculiar hircine odor, which is not very agreeable. The bark is a remedy of considerable reputation throughout all Columbia ; its aqueous infusion is used inwardly in diarrhœa and as a vermifuge, while the alcoholic tincture is employed externally in rheumatism. Its application for these purposes is extolled by both the medical profession and the public. It is said also to have proved useful in the treatment of cholera.

[In the United States, it is said to be largely used for the adulteration of ground spices. D. H.]—*London Pharm. Jour. Dec.* 1859.

CULTURE AND PRODUCTION OF ELATERIUM AT HITCHIN, ENGLAND.

Till within the last few years the cultivation of the wild or squirting cucumber (*Ecbalium officinarum* Rich., *Momordica elaterium* Linn.) was almost entirely cnnfined to Mitcham, in Surrey, and Ampthill, in Bedfordshire. Its cultivation is, we believe, given up at the latter place, at least for commercial purposes ; for, upon making inquiries there, we can obtain no information respecting it. At Hichin, however, it is now cultivated to some extent by Mr. Ransom, Pharmaceutical Chemist, of that town. We may conclude, therefore, that Mitcham and Hitchin are at the present time the only districts in which it is grown for commercial purposes. Its cultivation at the former place has already been described in this Journal (vol. x., p. 168); we propose now to allude to it at the latter.

At Hitchin, the plants are either raised from seeds or by division of the roots. When raised from seeds, these are sown in the spring, usually about the end of March or early in April ; the seedlings are then allowed to remain in the ground where they have sprung up, the soil having been previously highly manured with stable manure. A large number of plants are always self-sown. (The practice thus adopted at Hitchin is, in in some respects, different from that carried out at Mitcham, for here it is customary to sow the ground about March, and to plant out the seedlings about June.—*Pharm. Journ.*, vol. x., p. 168.) When the plants are raised by dividing the roots, this operation is performed in the spring, the plants employed for the purpose having remained in the ground during the preceding winter, at which season they are protected from the frost by being covered with manure and mould. As it is found that the slightest frost destroys the plants, it is necessary to be very careful in thus protecting them from its influence. The plants thus raised by dividing the roots are afterwards planted out in ground highly manured, as is the plan of raising from seed. From the above facts it is clear, that the squirting cucumber, although an annual under natural conditions, yet, by being protected during the winter, its existence may be prolonged beyond a year—indeed, we have seen plants which we have been informed were more than three years old. Hence, an annual plant thus becomes a perennial. Mr. Arthur, of Mitcham, has also observed "that if the roots be covered up during the winter, the plants survive through several seasons; and he has now some which have lived three or four years." The fruits which are borne by plants more than two years of age, are, however, much smaller, and their yield of elaterium less than those of younger plants; hence it is not customary to grow plants for commercial purposes beyond the second year of their existence.

The plants grow most luxuriantly in a damp, loamy soil; but it is found that a too great development is unfavorable to the production of the fruit, which is the only serviceable part of the plant, because in all cases where the nutritive organs of a plant become highly developed, but little fruit is produced. Hence a moderately dry, loamy soil, which has been highly manured, is that best adapted for the growth of the squirting cucumber. We are informed that a hot, moderately rainy season is that in which the plants thrive best, and yield most elaterium.

The plants flower freely in July and August, and towards the end of the latter month, and the first two or three weeks in September, the fruits are gathered for the preparation of elaterium. It is necessary to gather the cucumbers as nearly ripe as possible, for otherwise they will yield but a very trifling amount of the best elaterium; but, in consequence of their being thus collected in a comparatively ripe condition, the produce of many is lost, from the peculiar and well-known tendency of the fruit to discharge its contents when but slightly touched as it approaches ripeness. The common name of squirting cucumber, as applied to this plant, is thus derived. This loss of the juice in the fields during the process of gathering the cucumbers much increases the cost of obtaining and preparing elaterium. It is customary to employ boys to gather the cucumbers, and they are obliged to be very careful in handling the plants for the purpose of doing so, as otherwise the fruit frequently discharges its contents, and if this should reach the eye or other sensitive parts, serious consequences might ensue from the irritation thus occasioned. To show the injurious effects that sometimes result from carelessness in handling the fruits, it may be stated that, about two years since, some of the boys employed in gathering them began to play, and whilst doing so one of them squirted the juice into another's eye, and the inflammation excited thereby was so great, that the sight was for some time almost lost, in fact, it was more than a twelvemonth before it was entirely restored.

All the cucumbers produced at Hitchin are employed there for the preparation of elaterium. The process adopted (at least so far as can be ascertained by us, for there are certain peculiarities connected with the mode of collecting and manipulating the elaterium which are kept secret) is as follows:—As the cucumbers are brought in from the field, they are at once washed to free them from adhering dirt and other foreign matters. This process of washing is, we are informed, always resorted to, but it becomes more necessary when the fruits are very dirty. Each cucumber is then cut lengthwise, so as to divide it into halves. This operation is usually performed by boys, and as the fruit is thus cut, the halves are received into glazed earthenware pans. The divided cucumbers are then placed as soon as possible in a hempen cloth, and the whole afterwards placed in a common screw-press. A moderate pressure is now employed to press out the contained juice, which is allowed to run into a glazed earthenware vessel placed ready for the purpose, and at the top of which a sieve is put, so that the expressed juice is strained as it runs from the press, and thus before any deposit can have taken place, which we regard as a very desirable mode of procedure. Mr. Ransom informs us that he is very careful not to have much pressure exerted, for otherwise the elaterium is much deteriorated in quality, and as we have had an opportunity of seeing the cucumber after having been submitted to pressure, we observed that they were but moderately crushed, and hence the pressure employed could not have been very great, or they would have been reduced to a more pulpy condition. The juice as it runs through the sieve is somewhat turbid, and of a greenish-yellow color. When the pressure has been continued for a few minutes, and the juice all run out from the pressed cucumber, it is poured into glazed earthenware jars, and allowed to stand for about twelve hours, by which time the whole of the elaterium will have been deposited in the form of a greenish, slightly yellow mass. (The time thus allowed for the deposition of the elaterium is much longer than that commonly adopted; thus, at Apothecaries' Hall about two hours are considered sufficient for the purpose, and at Mitcham the time allowed varies usually from three to four hours.) The supernatant liquor is then very carefully removed, and the deposit collected in a cloth. This deposit is then dried in a room heated by steam to a temperature of about 100° Fahrenheit, and the preparation of the elaterium is completed. The exact mode in which the supernatant liquor is removed and the deposit collected and dried, is a secret. In some places where elaterium is prepared, it is the custom to put aside the supernatant liquor and allow it to deposit again. The elaterium thus obtained is of a paler color and inferior in strength to the former. No use is, however, made at Hitchin of this supernatant liquor, but it is thrown away after the first deposit has been obtained. In fact, the time allowed for the first deposition is so long, that it is not likely that any further deposit would take place.

The amount of elaterium obtained from a bushel or forty pounds of cucumbers, is about three drachms. This accords very nearly with the experience of others. Thus, Mr. Arthur, of Mitcham, states that one bushel of fruit will yield about half an ounce, and Dr. Clutterbuck says that he obtained from half a bushel "less than two drachms of elaterium." We may fairly conclude, therefore, that half an ounce of good elaterium per bushel is about the ordinary yield, and that if a larger quantity be obtained, as is sometimes the case, that the excess is probably due to the use of too much pressure, and the resulting elaterium of inferior quality. We are informed, however, that the quantity of elaterium that can be obtained varies somewhat according to the weather in which the fruit is collected; thus, when the cucumbers are gathered in wet cool days, the yield is less than when they are obtained on a hot dry day.

The elaterium thus prepared at Hitchin is all sold to the wholesale druggists. We believe that much of the elaterium prepared in this country is not used here, but that a great proportion is exported to America and the Continent, where it is much more frequently employed as a medicinal agent. We think it probable that elaterium would be much more employed as a medicine in this country could it be always obtained of uniform strength; but on account of the various modes employed for preparing it, and the adulterations to which it is liable, that is far from being the case; and with such a powerful medicinal substance as it undoubtedly is, such a want of unformity leads to serious consequences. We consider it, therefore, very desirable to publish the processes of those who prepare good elaterium.

The elaterium, as thus prepared, is of a pale green color, with a slight yellowish tinge which become more apparent by keeping. It is in light, thin, slightly-curved pieces, which break readily and with a short fracture. It is readily reduced to powder when rubbed between the thumb and forefinger, thus proving the absence of any mucilaginous matter. It has a somewhat fragrant and agreeable odor, which is quite of a peculiar nature, for if it does not recal any other substance to us, although by some writers on materia medica the odor of elaterium has been compared to that of ergot of rye combined with the fragrance of senna or tea.—*Pharm. Jour. Dec.* 1859.

SACCHARATED LIME.

Lime dissolves in water in much larger proportion in presence of sugar, and this solution is strongly recommended as a tonic and antacid by Dr. John Cleland (*Edinburgh Med. Journ.*, August, 1859).

Dr. C. gives the following formula for its preparation:—

"Slake 8 ounces of quicklime; rub up with it 5 ounces of white sugar; add 1 pint of water; stir for some time, till the hard stiff masses which the sugar and lime are liable to run into are as much as possible dissolved; then filter. The product should be perfectly clear, and of only a slightly yellowish tint. A solution made in this way will contain 18 grains of lime in every ounce by weight, and altogether about 106 grains of solid matter to the ounce. Taken undiluted, a few drops are sufficient to roughen the tongue. When diluted, the taste is at first an acrid one of lime ; but this is immediately replaced by a sweet taste in the back of the mouth, admitted to be pleasant. Made as just recommended, the solution is not liable to decomposition unless it is exposed to the air. By employing a smaller proportion of water to lime, a still stronger solution may be obtained, but not with any practical advantage, as there is increased difficulty of filtration and greater tendency to decomposition."

This preparation, Dr. C. states, "is, of course, a powerful antacid, and probably the best we have, since it is stronger and pleasanter than magnesia, and does not weaken digestion like the alkalies. Far from doing so, its most important use is as a tonic of the alimentary system in cases of obstinate dyspepsia. As such, its action is much more powerful than that of the vegetable stomachic tonics. It is suitable for cases with too little as well as for those with too great secretion of gastric juice, no doubt because the former state of matters is obviously a result of atony, which the lime removes. It seems particularly serviceable in gouty constitutions. In the dyspepsia of hysterical and anemic cases it does not seem to be of great use. Care should be taken to tell the patient not to take it before breakfast, as it sometimes causes a degree of nausea in the morning, when the stomach is empty. It suits very well to take it immediately after meals ; its alkalinity does not at all interfere with digestion. Practitioners seem generally to take up the prejudice beforehand, that saccharated lime must be liable to produce constipation, probably judging so from the action of chalk ; but I wish particularly to insist that it has not, in the slightest degree, any tendency to occasion such an effect. On the contrary, it is a very valuable means of overcoming gradually that chronic constipation which is so frequent an accompaniment of dyspepsia ; and persons who have for years been in the constant habit of using aperient medicines have been able to abandon them in great measure after taking this remedy for some time. In a single instance it acted as a purgative, so that its use could not be continued. It will be found serviceable in checking the diarrhœa of disordered digestion, acting as lime-water does, only that the latter is so dilute that it is often impossible to administer it to adults in the quantity desirable. Patients who take saccharated lime habitually get to like the taste, and seem to think it exhilarating. It may be found useful also in allaying the cravings of the intemperate. I have no doubt that, if it be fairly tried, practitioners will find it an exceedingly useful remedy. It may be given in doses of from 20 or 30 to 60 minims or more, in a glass of water, two or three times a day."—*Am. Journ. Med. Sec. Jan.* 1860.

NOTE ON ARSENIC IN TRISNITRATE OF BISMUTH.

By Mr. John Morland, Analytical Chemist.

During the progress of Dr. Smethurst's trial, the presence of arsenic in commercial trisnitrate of bismuth was brought forward by the witnesses for the prisoner to account for the arsenic found by Dr. Taylor in one of the evacuations. Wishing to repeat the examination of trisnitrate of bismuth for arsenic, I obtained two samples of it from Pharmaceutical Chemists in the City; in both I found traces, though but slight ones, of arsenic. I was, however, surprised to find that both the samples contained chlorine; in one it corresponded to 72.5 per cent. of subchloride, in the other to 19.2 per cent. As the subchloride contains a larger percentage of bismuth than the subnitrate, it can scarcely be economical to substitute it for the latter; probably the finer powder obtained, together with the more easy solution of bismuth in aqua regia than in nitric acid, is the inducement. I understand that a subcarbonate is also prepared in London.

The above fact is not without a bearing on the presence of arsenic in the bismuth preparations, as arseniate of bismuth is barely soluble in nitric acid, whilst in hydrochloric acid it is freely dissolved, and reprecipitated with the subchloride on the addition of water. To prove this, I prepared subnitrate and subchloride of bismuth from metallic bismuth, to which a large quantity of arsenious acid had been added; the solutions, as ordered by the Pharmacopœia, were both filtered before percipitation by water, and resulting subsalts tested for arsenic; there was only a trace in the subnitrate, whilst in the subchloride it was abundant, as also in subcarbonate prepared from the chloride.

Mr. John Huskisson, jun., observed that, considering the way in which subnitrate of bismuth was usually prepared, there could not be more than a mere trace of arsenic in it. The metallic bismuth was first roasted at its fusing point, during which process the arsenic, which volatilizes at about 367°, was driven off. The purified bismuth was then dissolved in nitric acid, and the nitrate obtained in crystals. These crystals were afterwards decomposed by the addition of water, and the subnitrate was thus obtained, while any arsenic that might have escaped volatilization in the roasting would be left in the mother liquor from which the subnitrate was precipitated.

Dr. Redwood thought the process described by Mr. Huskisson was better than that given in the Pharmacopœia, and he approved of using the crystals rather than the acid solution of nitrate of bismuth for precipitating with water, as the product would be less liable to variation. He did not think, however, that the roasting of the metal could be depended upon for the removal of the whole of the arsenic, nor did he consider the subnitrate, in whatever way prepared, a satisfactory preparation. He thought, it might, with advantage be replaced by the subcarbonate.

Mr. Morland inquired of Mr. Huskisson how he accounted for the presence of chlorine in the subnitrate of bismuth of commerce.

Mr. Huskisson said there were two compounds of bismuth prepared by manufacturers—the subnitrate or trisnitrate, which was used in medicine, and the oxychloride, for the preparation of which every manufacturer had a process of his own, and of which large quantities were used in the arts, as an ingredient in enamel, as a cosmetic, and in the preparation of sealing-wax. As the oxychloride was more expensive than the subnitrate, he thought its substitution for the latter must have been the result of accident, or probably the person selling it thought, as it was not ordered for medicinal use, that it was required as a pigment, and therefore that the oxychloride was the sort wanted.

The Chairman confirmed what had just been stated with reference to the oxychloride of bismuth, which he said, with far more extensively used than the subnitrate, especially in the manufacture of white sealing-wax. He thought the subcarbonate of bismuth a better preparation than the subnitrate, and less likely to be impure.— *Pharm. Journ. and Trans. Jan.* 1860.

ON LIQUOR FERRI IODIDI, AND THE TESTS OF IODINE.

By Ferdinand F. Mayer, of New York.

In laying the following remarks before the meeting, I must state that some of the facts I shall mention are truly enough not new; but as I have endeavored to arrange and harmonize them with my personal observations, they may contribute much to the understanding of the changes which this preparation is liable to, and of the remedies proposed for their alleviation.

First, as to the strength of the liquor. I have made this preparation by all the formulas given in the different Pharmacopœias and books, some with a greater or less excess of iron, some with iron wire, others with filings, some with application of heat, others without; some filtered into sugar, others into syrup—but in not a single instance have I found them to contain fully the proportion of iron corresponding to the amount of iodine employed.

The solution, always directed to be made by digesting iodine and iron in varying proportions, is of an acid reaction. It is thus not only shown by the test on blue litmus paper, which might possibly and partly be supposed to arise from the action of the iodide on the organic substance, but also by the continued disengagement of hydrogen gas, if ever so slow, going on in the solution when digested at a higher temperature with clean iron wire or metallic zinc. That a formation of hydriodic acid takes place during the reaction, in the first place, of iodine on iron is made quite perceptible by the smell of carburetted hydrogen arising from the mixture, especially when heated or made from filings. This excess of hydriodic acid in no case amounts to more than two per cent. of that in combination, but is in no other way injurious to the preparation. A deficiency of iron is further caused by the never-wanting impurities of iodine. I shall further on return to the tests of this substance.

The strength of the officinal solution in iodide of iron should be set down as seven grains per ounce.

The large excess of iron used does in no way contribute to increase the proportion of it going into solution. It rather causes a loss of iodine by inducing too rapid a combination and evolution of heat. The ingredients should be kept as cool as possible, though it may require a little more time. Application of heat will always drive off a portion of iodine; and much more sesquioxide of iron will be found suspended in the liquid after heating.

The use of iron filings should be discarded. Not only that they are objectionable on account of the impurities which they unavoidably contain, but their action on the iodine is far too rapid, even when no heat is applied. An admixture of brass filings, which must have been in use in the coppery preparation, examined by Mr. Maisch some years ago, is by no means uncommon.

It is of some importance that the water employed should be free from organic matter and air. Distilled water is directed to be used; but I venture to say, this direction, as in most other instances, is but rarely followed. There is somewhat of an excuse for the scarcity of distilled water in the shops, from the fact that it costs far more than would balance the advantages derived from its use in many preparations. But, why not use melted ice? It is strange that so excellent a substitute for distilled water has hardly ever been mentioned. The writer has been using it during the whole summer for the same purposes, and never found it to act in the slightest degree on nitrate of silver or baryta. It is best prepared by melting clean, transparent pieces of ice in a glass jar, and drawing off by means of a siphon, from what sediment may have formed during melting. I would recommend this to the consideration of the Association, since, throughout the whole country, ice has now become so common an article for domestic use, that pure water will be within the reach of every one, if its production in the manner indicated is once admitted as a fact.

The mixing of the ingredients should not take place in a porcelain dish, but a glass flask or vial, since no heat from without is required to induce their action on each other. Of the recipes published for this preparation, none appears to answer so well as that given by Dr. Squibb, (vide Proceedings for 1858,) principally by the manner in which the fresh solution is protected from the action of air from without, and that in the sugar. This one cause of the changes, which the saccharine solution undergoes, is most effectually removed by filtering into syrup. But not the action of the air, which afterwards comes into contact with the liquor, from the surface downwards. I have as yet not seen a liquor of Syrupus Ferri Iodidi which did not turn brown when the bottle containing it was frequently opened or left open.

The following experiments were made as continuing those of Mr. Maisch, published in the American Journal of Pharmacy of 1854. I merely give the results of the different tests, the details being too lengthy. The solutions were all made with chemically pure iodine and fine iron wire.

The officinal Liquor Ferri Iodidi contains free hydriodic acid, and the quantity of iron in solution is not sufficient to bind all iodine.

Cane sugar is completely changed to grape sugar by heating with dilute hydriodic acid. Freshly prepared simple syrup, diluted with water and heated with a small quantity of hydriodic acid, a portion of the liquid precipitated by nitrate of silver and filtered, the excess of silver removed by carbonate of potassa, and the filtered liquid added to a hot alkaline solution of potassio-tartrate of copper,—showed the distinct reaction of grape sugar, that is, precipitation of suboxide of copper. To judge from the test with ferri cyanide of potassium, as lately given by Anthon, no cane sugar was left in the liquid.

Cane sugar is changed to glucose with hydriodic acid, and the light and heat of the sun acting together. The qualitative tests were made as above, and showed the presence of grape sugar, but only in a small proportion.

Hydriodic acid dissolves a large amount of hydrated sesquioxide of iron, forming a yellow solution, and a deep blue precipitate with ferro cyanuret of potassium. On heating, it turns pale under escape of iodine, and then precipitates a paler blue. When cane sugar is present, it is converted into glucose.

The browned Liquor Ferri Iodidi heated with hydriodic acid or iodine is brought back to its original color with disengagement of iodine and formation of grape sugar. It then gives a pale blue precipitate with ferro cyanuret of potassium, which turns dark rapidly. To find the presence of any acid besides hydriodic, I precipitated part of the bleached liquid with nitrate of silver, washed the precipitate, and decomposed it by digestion with metallic zinc. The solution of zinc, which should contain all the iodine previously combined with the silver, was precipitated by carbonate of soda, and the alkaline solution tested for iodic acid, qualitatively and quantitatively. It showed no formation of iodine by the addition of hydrochloric acid, but some was set free by sulphuric acid. The first test is conclusive as to the absence of iodic acid, the latter reaction takes place with all iodides, whether an iodate be present or not. I determined the quantity of iodine present by oxidation with a graduated solution of hypochlorite of soda. The amount found corresponded precisely with the quantity of the silver contained in the precipitate.

I conclude from this absence of iodic in the decolorized liquor prepared from pure iodine, that the sample examined by my friend Maisch, had been made from iodine containing a small portion of chlorine. This is a very common admixture, and very few samples of iodine will be found, which, when water is poured on, do not at once give a brownish solution, owing to the presence of chloride of iodine.

The change which takes place on exposing Liquor Ferri Iodidi to the air is owing to the action of atmospheric oxygen on the protoxide in solution, precipitating a basic hydriodate of the sesqui-oxide of iron, and setting free some hydriodic acid, which in connection with the acid of the solution, partly decomposes again some of the sesqui-oxide, forming protoiodide and free iodine. When this brown liquor is heated in a porcelain dish, its color becomes lighter in the measure as the free acid decomposes the sesqui-oxide, and the iodine is dissipated. It turns colorless if hydriodic acid or iodine be added while boiling. *It may be evaporated to dryness in a salt bath, allowing a slight excess of iodine to be present during the whole of the evaporation, and it will again be perfectly soluble in water, yielding a green precipitate with potassa.* During the heating, most if not all the cane sugar of the solution is converted into glucose. A similar reaction takes place when the stoppered bottle containing the brown liquor is exposed to the direct rays of the sun. Here the formation of glucose by hydriodic acid takes place, though not as complete as in the open dish; but it super-induces the action of the acid on the suspended sesqui-oxide, which is there by completely converted into protoxide, its oxygen and the hydrogen of the acid being taken up by the sugar.

That sesquioxide of iron is dissolved by hydriodic acid and converted into protoxide by heating the solution, is an old fact, and a number of very delicate volumetric methods are founded on this reaction. Any one may repeat the experiment with a dark liquor ferri and a small quantity of iodine, tincture of iodine, or iodide of potassium. The result will in all cases be a protosalt of iron. Acting on this principle, the evaporation of the solution in water will be rendered more simple, and will furnish a perfectly soluble salt, if, during evaporation, a small excess of iodine be directed to be added.

But even though the Liquor Ferri Iodidi when heated with iodine may have lost none of its original qualities, its permanency is hardly better than before. Nor does the presence of bright iron wire in the syrup appear to prevent the separation of sesqui-oxide. Among the deoxidizing substances within our reach, there is, however, one, the chemical and medicinal properties of which are by this time well understood, which in analysis is frequently employed to act either on iodine or sesquioxide of iron, and which, besides, is very cheap,—I mean the *Hyposulphite of Soda.* You will find among the preparations submitted to the inspection of the meeting a bottle labelled "Protoiodide of Iron, without Sugar." It is, or ought to be, a perfectly limpid, pale green liquid, containing the same proportion of iron as the officinal liquor, but one-sixteenth more than the amount of iodine. It is prepared as follows:—

Take of Iodine,	two ounces and one drachm.
Fine Iron Wire,	six drachms.
Pure Water,	q. s.
Hyposulphite of Soda,	two drachms.

Place two ounces of the iodine with five ounces of water in a glass flask or prescription bottle, add the iron gradually, and shake, unless the mixture becomes too warm, until a pale green solution is obtained. This pour off into a tincture-bottle marked at the point indicating twenty fluid ounces. Add the last drachm and agitate until dissolved. Rinse out the first flask with some water, which is added to the iodine solution. Then dissolve the hyposulphite of soda in enough cold water, and add it gradually to the solution of iron until the latter, under shaking, is discolored. Dilute to twenty ounces, and filter in a glass-stopper bottle. If two drachms of hyposulphite are insufficient to discolor, it is a proof of its impurity, and more should be added until the result is attained. If too much has been added, it will precipitate some very finely-divided sulphur, which may be redissolved by the addition of a little iodine. The solution, before filtering, is best left standing over night, when all excess of hyposulphite will have been decomposed by the free hydriodic acid present.

The excess of iodine and the hyposulphite of soda are added in equivalent proportion, in which they form hydriodic acid and tetra-thionate of soda, the salt of the acid which does not precipitate the salts of baryta. This soda-salt is perfectly inert, but insures the permanency of the proto-iodide to a remarkable degree. It may be passed through a number of filters without being oxidized. It may be sweetened by substituting syrup for part of the water, which, however, does not improve its appearance or permanency. The dose need not be reduced from that of the officinal, though containing slightly more iodine.

In addition to the above remarks, the writer will give what appears to him much needed in our Pharmacopœia; that is, simple qualitative and quantitative tests for iodine and iodide of potassium.

The presence of water and cyanide of iodine in commercial iodine is found by the tests described in the Dispensatory. The presence of chlorine must be suspected when the iodine imparts a brown color to water. It is found by heating a strong solution of a neutral persulphate of iron, (iron alum,) free from chlorine, with the iodine, until no iodine appears to be dissipated, when the solution of iron will give a precipitate with nitrate of silver if chlorine was present in the iodine.

We have two very accurate tests for free iodine, founded on the oxidation of arsenite of potassa to arseniate, and of hyposulphite of soda to tetra-thionate.

A test solution of arsenite of soda or potassa, for the use of the pharmaceutist, is prepared after the manner directed for Fowler's Solution, using 70 grains of acid and 140 of bicarbonate of potassa to one quart or two pounds (avoirdupois) of test-liquid. The iodine to be examined, say five grains accurately weighed, is placed in a porcelain mortar with a little bicarbonate of potassa or soda, and a drachm or so of the solution of arsenite from a vial previously tared on a balance. A few drops of a solution of starch are then added, and rubbed up with the iodine, and then the solution of arsenite slowly, and towards the end drop by drop, until the blue color of the starch all at once disappears. The difference in the weight of arsenite of potassa is then an accurate measure of the quantity of pure iodine. One hundred grains of the solution are equivalent to 1·269 grains of pure iodine.

The solution of hyposulphite of soda is prepared by dissolving 350 grains of the salt in water, and dilute to one quart or two pounds avoirdupois. The iodine, when to be examined by this test, must first be dissolved in iodide of potassium, after which the reaction goes on as with arsenite of potassa; one hundred grains being equivalent to 1·269 grains of pure iodine. These solutions are very dilute, and by the comparative largeness of the dose needed for small quantities of iodine, a great margin is left. The above solution of arsenite serves as a measure for hypochlorite of soda, chlorine and chloride of lime. It is added to a known quantity of these substances, until a drop of the mixture ceases to produce a blue spot on white paper sized with iodide of potassium and starch.

Regarding the qualitative tests of iodide of potassium treated on in the Dispensatory, it must be added that the solution of the salt must be dilute when tested with sulphuric acid and starch; for strong solutions disengage the iodine at once. The test described for chlorine contained in iodine is equally as well applied to iodide of potassium. The persalt of iron must be perfectly free from chlorine. The resulting solution of iron treated with chlorine water and ether shows bromine, if present. In Personne's test for bromide, the sulphurous acid is advantageously replaced by hyposulphite of soda. Iodate of potassa is present when, on the addition of pure hydrochloric acid, free iodine makes its appearance.

The quantitative test of Marozeau, as described by Mr. Maisch some years ago, is sufficiently accurate for the purposes of the pharmaceutist. The quantity of iodate in a sample is found by adding some hydrochloric acid, and determining the quantity of iodine set free by the solution of hyposulphite of soda, described above. For each six equivalents, or 7·6 (seven $\frac{6}{10}$) parts of iodine found, put 2·14 parts of iodate of potassa.—*Proc. Am. Pharm. Assoc.*, 1859.

FLUID EXTRACT OF BURDOCK.

By Israel J. Grahame.

Some demand for this preparation, having arisen in the establishment of the writer, and not finding a published formula for it, the following is suggested as productive of a result every way satisfactory.

It is believed that this fluid extract might be advantageously substituted for that of sarsaparilla, as a more efficient and reliable alterative, or at least as a valuable addition to it.

Take of Burdock, in powder, No. 50, . . sixteen ounces.
Diluted Alcohol (Alcohol 4½ parts, Water 3½ parts,) a sufficient quantity.

Dampen the powder with the menstruum and pack it in a suitable glass displacer; having covered the surface with a piece of muslin or perforated filtering paper, pour on the menstruum and continue the percolation to exhaustion, reserving one and a half ounce of the first runnings, evaporate the remainder over a water bath until reduced to nine fluid ounces, to which add four ounces of sugar and dissolve. Strain, if necessary, and add the reserved portion.

The dose of the extract is one teaspoonful, representing eighty grains of the root.—*Journ. and Trans. Med. Col. Pharm.*

ON ISOMERIC ALKALOIDS.

By C. Greville Williams.

While investigating the organic alkaloids produced by destructive distillation, I was struck by the almost entire coincidence of the formulæ of the bodies found from the most opposite sources. Thus coal, bituminous shale, Dippel's oil (bone oil), and cinchonine, all appeared to yield alkaloids belonging to the same series. But although the composition of the same alkaloids from each source was identical, and even their boiling points agreed as well as could be expected, yet there were differences in the smell, power of forming crystalline salts, &c. which presented themselves during the course of these long investigations, and at times almost induced a belief that I was dealing with isomers instead of identical bodies. The greatest differences were found with the bases produced by destructive distillation of cinchonine. Here the odor of the alkaloids was so different to that of the same bodies extracted from other sources that I long oscillated between two opinions. However, the resemblances were too numerous to justify me in announcing the pyridine series, as obtained from cinchonine, to be a new class of alkaloids. In fact, the absence of absolutely distinct reactions rendered such a course impossible. I have, however, at length discovered a reaction with the chinoline series as obtained from cinchonine, which is so totally different from anything which can be obtained with the chinoline series from coal tar, that I am fully persuaded of their being essentially different.

Chinoline, or lepidine from cinchonine, was boiled with iodide of amyle for a few minutes, after which water was added, and the boiling continued for a short time. The product was a brown oily looking fluid suspended in the water. A little ammonia was now poured in, and the boiling continued for a short time longer, when the whole of the oil became converted into a magnificent blue color of the utmost intensity. It dissolves readily in alcohol, and the diluted fluid dyes silk of a fast and most brilliant blue, having a slight shade of purple.

So strong is the attraction of silk for the dye that the bath becomes colorless, every trace of color being taken up. It has but small tendency to unite with cotton, for if the latter, after being dyed blue, be boiled with silk, the cotton becomes colorless and the silk absorbs all the color.

The coal tar bases of the same composition present nothing similar. They may, it is true, be made to yield superb coloring matters, but by totally different modes of procedure.

I am at present endeavoring to ascertain whether the pyridine series from cinchonine possess any features sufficiently distinct from the same series as extracted from coal, to justify the conclusion of their being a distinct class.—*Chemical News*, *Dec.* 17, 1859.

Varieties.

A Substitute for Lint.—Mr. J. R. A. Douglas, formerly house surgeon, Middlesex Hospital, in a letter to the *Lancet*, July 23, recommends the following substitute for lint, which is in extensive use in the Parisian hospitals:—"I have Anglicised it by the name of 'pink,' as pinking is the process by which it is made. It is merely cheap cotton perforated by a common punch. The long-cloth is folded some fourteen times, and holes are driven through it with a hammer and a sixpenny punch on a piece of lead. The holes are about one-eighth of an inch in diameter, and twice their breadth from each other. My firm having been for many years surgeons to Messrs. Curtis and Harvey's powder-mills, I have had opportunities of testing it in burns and other large suppurating surfaces. These being extremely sensitive, do not require the removal of the pink so frequently as lint or other applications, as the pus passing through the perforations is easily removed with a soft sponge, which cannot be done with other applications, nor will the highly vascular granulations in burns bear the sponge when uncovered. I have found it very useful in gun-shot wounds, and in compound fractures, where, as a perforated bandage, it gives support without confining the discharge, which never accumulates under it; and when removed, the surface is covered with healthy lymph without pus. Mr. Ashbee, the intelligent manager of Messrs. Curtis's powder-mills, has promised to prepare some linen or cotton by their elaborate machinery, if possible; in the meantime, the hospital patient, nearly convalescent, would be grateful for the occupation to relieve his monotony, and the cheapness of material and instruments makes it worthy of trial. Any ointment may be spread on it; and where large pieces are used, it can be rewashed.—*Chemist and Druggist, Sept.* 1859.

For Bleaching Ivory.—The process for bleaching bone and ivory is as follows: the bone or ivory is first to be rubbed with pounded pumice-stone and water, and then placed moist under a glass shade, which must be well luted to the stand at the bottom, and exposed to the heat of the sun. The sun's rays, without the glass shade, would be likely to produce fissures or cracks in the bone or ivory. The moist rubbing and exposure may be continued until the desired whiteness is attained. Beasley says a solution of sulphuric acid will bleach ivory.—(Correspondent.)—*Chemist and Druggist, Jan.* 1860.

Chlorodyn.—Dr. Ogden requests the following formula to be used in preference to the one published in your October number—Chlorodyn:—

℞ Chloroformyli, fʒvj.; Æther Chlor. fʒj.; Tinct. Capsic. fʒss.; Olei. Menth. Pip. gr. ij.; Morphiæ Hydrochlor, gr. viii.; Acid. Hydrocyan. (Sch.) gr. xij.; Acid. Perchloric, gr. xx.; Tinct. Can. Indicæ, fʒj.; Theriacæ, fʒj.; Misce.

The importance of the medical profession knowing what they prescribe, needs no comment.—*Ibid.*

Soluble Glass.—Fuch's soluble glass is made by heating together 15 parts pure sand, 10 carbonate of potash, and 1 of charcoal. This can be dissolved in 4 or 5 parts of boiling water, which should be then evaporated to the specific gravity 1·24.—*Ibid, Dec.* 15, 1859.

Proposed New Weights for Use in Pharmacy.—Mr. Squire laid before a recent meeting of the Pharmaceutical Society a set of avoirdupois weights, with the equivalent in grammes marked upon each weight. He had previously drawn the attention of the society to the comparative values of troy and metrical weights, but as it was now probable that the avoirdupois weight would be adopted in the forthcoming Pharmacopœia, with a reference to the equivalents in grammes, it was desirable that pharmaceutists should make themselves acquainted with the relations existing between them.—*Chemist and Druggist, Dec.* 15, 1859.

Mauve Dye.—This exquisitely beautiful dye for silks is prepared by taking equivalent proportions of sulphate of aniline and bichromate of potash, dissolving them in water, mixing, and allowing them to stand for several hours. The whole is then thrown upon a filter, and the black precipitate which has formed is washed and dried. This black substance is then digested in coal-tar naptha, to extract a brown, resinous substance; and finally digested with alcohol, to dissolve out the coloring matter, which is left behind, on distilling off the spirit, as a coppery friable mass. This is the dyeing agent, producing all the charming varieties of purples known by the name of mauve, which, as it appears to us somewhat inappropriately, has been given to this color. The particularity of these purples consists in the peculiar blending of the red and blue of which they are constituted. The permanence of these hitherto fugitive combinations is their strongest recommendation.—*Ibid.*

Native Country of the Potato.—In speaking of the potato, Dr. Weddell has recently made the following interesting remarks:—

"I never found the potato in Peru so circumstanced as to satisfy me that it is really wild in that country. Neither do I believe that it is wild in the distant stations on the extra-Chilian Alps where it has hitherto been thought so. When we consider that on the arid Cordilleras the Indians often fix their patches of cultivation on points that would appear almost inaccessible to our European farmers, it is easy to imagine how a traveller visiting one of these stations which had been long abandoned, and finding the potato accidentally surviving, would conclude that it must be really wild there. But where is the proof? For my own part, after reading all that has been written on the subject, I am forced to conclude that its real native country is Chili rather than Peru. There can be no doubt that the cultivation of the potato is of great antiquity, seeing that at the time of the conquest it was found in every part of the temperate portions of Western America from Chili to New Grenada and even Mexico, and I am very much inclined to think that it was everywhere the same species; for although the potato grown on the high plains of Peru possesses some degree of acridity, and resists frost better than those with which we are familiar, it does not appear from its botanical characters that it can be distinguished as a species rather than a simple race.——D'Orbigny brought from the summit of the Cerro de Potosi, and consequently from an elevation of 14,640 feet, a form of the potato which might be called Alpine. The leaves grow in rosettes and the flowers sit perfectly close upon the root. I found the same form in a piece of ancient cultivated ground on the Peruvian plateau at the height of 12,000 feet."—*Lon. Pharm. Jour., Dec.* 1859.

Metallic Cement.—M. Greshiem states that an alloy of copper and mercury, prepared as follows, is capable of attaching itself firmly to the surfaces of metal, glass, and porcelain. From 20 to 30 parts of finely divided copper, obtained by the reduction of oxide of copper with hydrogen, or by precipitation from solution of its sulphate with zinc, are made into a paste with oil of vitriol and 70 parts of mercury added, the whole being well triturated. When the amalgamation is complete, the acid is removed by washing with boiling water, and the compound allowed to cool. In ten or twelve hours it becomes sufficiently hard to receive a brilliant polish, and to scratch the surface of tin or gold. By heat it assumes the consistence of wax, and, as it does not contract on cooling, M. Greshiem recommends its use by dentists for stopping teeth.—*Ibid.*

Cleaning Glasses and Capsules.—There is often a difficulty in cleaning glasses or porcelain capsules to which organic matters have adhered, and in course of time become so hard and dry that they resist all solvents. The following process will be found to answer in almost every case:—

The spots to be cleaned are moistened with concentrated sulphuric acid, and powdered bichromate of potash is sprinkled upon the acid; the objects are then left standing for some hours (through the night) in a moderately warm place. All organic matters are by this means destroyed, with formation of sulphate of chromium, which may be removed by water with the residue of the acid.—*London Pharm. Journ., from Dingler's Polytechn. Journal.*

The Tea Tree in India.—Mr. Henry Mann, an enterprising gentleman who left China about five years ago, has introduced the tea tree to Southern India, having formed a plantation on the Neilgherries, which is now flourishing. The Madras Government has lately published an interesting report upon the subject. The plantation is situated about two miles and a half above Coonoor, at an elevation of 6000 feet, with an exposure to the north-east, and contains about 6000 plants. The ground occupied is about four acres. The plantation is on a slope. The forest land is found most suitable for the plants. It now only remains to test the leaf and to procure skilled manufacturers. This the Government was asked to do by the Conservator of Forests, but the application has been refused on the grounds of the inexpediency of Government interference with private enterprise. The importation of skilled manufacturers on speculation will not probably be ventured upon by any private individual for many years. The cultivation of tea in the hill districts of India seems to be spreading fast, and as these are the localities recommended for European colonization, we may yet see India rivalling China in this trade, and sturdy Anglo-Saxon pickers depicted on the tea chests instead of almond-eyed, long-tailed men of China.—*Ibid.*

A New Plaster.—M. Pasquier, of Roubaix, has exhibited to the Academy leaves of gutta-percha mixed with peroxide of iron, which he has long employed in the dressing of fractures and complicated wounds. The leaves soften in boiling water, and may be then readily applied around the limb, around which they become moulded, and lose none of their consistence through the heat of the body. After amputation he uses nothing but this gutta-percha—neither charpie, compress, or bandage.—*Ibid.*

Production of French Perfumes.—The chief places of their production are the south of France and Piedmont, namely, Montpellier, Grasse, Nismes, Cannes, and Nice; these two last, especially, are the paradise of violets, and furnish a yearly produce of about 13,000 lb. of violet blossoms. Nice produces a harvest of 100,000 lb. of orange blossoms, and Cannes as much again, and of a finer odor. 500 lb. of orange blossoms yield about 2 lb. of pure Neroly oil. At Cannes the acacia thrives particularly well, and produces yearly about 9,000 lb. of acacia blossoms. One great perfumery distillery at Cannes uses yearly about 140,000 lb. of orange blossoms, 20,000 lb. of acacia blossoms (*Acacia Farnesiana*), 140,000 lb. of rose leaves, 32,000 lb. of jessamine blossoms, 20,000 lb. of violets, and 8,000 lb. of tuberoses, together with a great many other sweet herbs. The extraction of the ethereal oils, the small quantities of which are mixed in the flowers with such large quantities of other vegetable juices that it requires about 600 lb. of rose-leaves to win one ounce of otto of roses, demands a very careful treatment. The French, favored by their climate, are the most active, although not always the most careful, preparers of perfume; half the world is furnished by this branch of their industry.—*Ibid.*

The Extraction of Potato Starch.—In the manufacture of this article a considerable quantity of the product is lost owing to the strong affinity the starch has for the fibre of the potato. From M. Anthon's experiments on the subject, it appears that the manufacturer only extracts two thirds, and that the remaining third is left in the pulp. M. Anthon suggests that this third may be utilized by converting it into sugar, by means either of malt or dilute sulphuric acid. By employing 10 per cent. of the acid to the dry fibre, the saccharification is completed in about two hours and a half; but if only 3 or 4 per cent. of acid is used, the boiling must be continued for at least five hours. Ten per cent. of malt effected the conversion in six hours. The result as to the quality and quantity of sugar produced is the same whether it is obtained by malt or sulphuric acid.—*Chem. News, from Chemisch Central Blatt,* 1859.

Cubilose.—M. Payen has submitted to a chemical examination, the substances contained in the bird's nests which are used by the Chinese as an aliment, and form among the Oriental nations the object of a large commerce. These nests, as is well known, are constructed by a species of swallow, which the French term *Salangane.* The quantity of nests exported yearly from the Indian archipelago is estimated at 242,000 lb. English. The value of the substance is from 100 to 150 francs a pound. In Paris, these swallow nests sell sometimes as high as 400 francs a pound, or 5 or 6 francs per nest. They are sold ready for eating. Many naturalists think that the nests are composed of the spawn of fish, or of a mixture of various zoophytes; others think they are made of a certain juice which exudes from some unknown tree, or that they are constructed with lichens and gelatinous algæ. It appears certain, however, that the swallows produce at the time of nidification a mucilaginous liquid, secreted from their salivary glands, or by the glands of one of their stomachs, in the same manner that the swallows of Europe secrete a viscous liquid with which they cement together the materials of their nests in the window corners of our houses.

M. Payon's investigations show that such is the case; the agglutinative and alimentary principle of the Salangane's nest sometimes forms the greater part, or even the whole of the nest, and is a peculiar secretion analogous to animal mucus containing nitrogen (9·52 per cent) and *sulphur,* devoid of organisation, sinking in water, and dissolving almost entirely in hot water, taking an orange color with iodine, soluble in diluted and warm alkaline solutions, &c. To this new immediate principle, the author has given the name of *cubilose*, which implies the use and natural state of the secretion in question.—*Chem. News, Dec.* 24, 1859.

Solubility of Alkaloids in Olive Oil.—We have already furnished our readers, Pettenkoffer's experiments on the solubility of alkaloids in chloroform (page 17 of this volume). We now furnish the result of his observations on their solubility in olive oil. It is suggested such solutions might be employed instead of pomatums or ointments for external application of these agents.

100 parts of olive oil, at ordinary temperatures, will dissolve of

Morphia, . . .	0.00	parts.
Narcotina, ...	1.25	"
Cinchonia, . . .	1.00	"
Quinia, ...	4.20	"
Strychnia, . . .	1.00	"
Brucia, ...	1.78	"
Atropia, . . .	2.62	"
Veratria, . . : .	1.78	"

Jour. de Pharm.—Journ. and Trans. of Md. Col. of Pharm. Dec. 1859.

Detection of Plumbago in Iron reduced by Hydrogen.—M. Liénart has found that the *pulvis ferri*, or iron reduced by hydrogen for medicinal purposes, is sometimes sophisticated with plumbago or black lead. This fraud is easily detected by dissolving the iron first with weak sulphuric acid, and terminating the operation with aqua regia; the plumbago remaining can be collected upon a filter and examined. The author has found as much as 14 per cent. in some specimens.—*Chem. News, Dec.* 10, 1859.

Reinsch's Test for Arsenic.—In experimenting on different solutions of the salts of arsenic by Reinsch's test, it is very important to know that there is a considerable difference in point of time before the copper wire becomes coated with Arsenic. The *Arseniates* show it almost the instant the liquid boils; whereas the *Arsenites*, or more highly oxidised salts, require a longer time and greater degree of concentration before any deposit is obtained. A knowledge of this fact may prevent an erroneous conclusion being drawn as to the presence of arsenic, although it may not be immediately detected.

In combination with chlorates, as proved by Dr. Taylor in Smethurst's case, no deposit is obtained, the arsenic remaining in solution; whilst the copper is dissolved, and imparts a blue color to the liquid.

The *delicacy* of Reinsch's test has been greatly *underrated* by Taylor, Brande, and others, who state that arsenic fails to be detected when diluted to 120,000 times its bulk. How such a mistake should occur I cannot imagine; since, in accurate experiments lately made by me, I have detected it at a dilution of 560,000 times; and when at 280,000 times, the layer is so strong as to be fit for sublimation, having a bright steel color: at 560,000 times, however, the deposit is more of a violet color. These experiments were made by dissolving a grain of arsenious acid in a pint of distilled water, and diluting from time to time.

Compared with arsenic no deposit of antimony from a solution of tartar emetic took place at either of these points of dilution.—*J. Horsley, F.C.S.*—*Chem. News, Dec.* 10, 1859.

PHARMACOPŒIA CONVENTION OF 1860.

The following appointments of Delegates to the Convention for revising the Pharmacopœia, to meet at Washington on the first Wednesday of May next, having been duly made known to me, are hereby announced, in compliance with a provision of the Convention of 1850.

From the Massachusetts College of Pharmacy, Messrs. Theodore Metcalf and Charles T. Carney; from the New York Academy of Medicine, B. W. McCready, M. D., E. H. Davis. M. D., and E. R. Squibb, M. D.; from the College of Physicians of Philadelphia, George B. Wood, M. D., R. P. Thomas, M. D., and Robert Bridges, M. D.; from the University of Pennsylvania, Joseph Carson, M. D., R. E. Rogers, M. D., and Joseph Leidy, M. D.; from the Jefferson Medical College of Philadelphia, Franklin Bache, M. D., and T. D. Mitchell, M. D; from the Philadelphia College of Pharmacy, Messrs. William Procter, Jr., Edward Parrish, and Alfred B. Taylor; and from the Medical Society of the State of North Carolina, Wm. Geo. Thomas, M. D., Peter E. Hines, M. D., and Edward Warren, M. D.

By order of the Convention of 1850.

GEO. B. WOOD, M.D, *President.*

Philadelphia, Feb. 14*th*, 1860.

As we were going to press, the following communication was received from Dr. Wood:

"Since my former communication, the following appointments of Delegates have been announced to me:

From the Medical Society of the State of New York, Drs. E. R. Squibb Howard Townsend, and Caleb Green; from the College of Pharmacy of the City of New York, Messrs. Wm. Hegeman, Alex. Cushman, and John Meakim; from the Faculty of Physic of the University of Maryland, Profs. Samuel Chew, Charles Frick, and Wm. E. A. Aikin; from the Maryland College of Pharmacy, Messrs. G. W. Andrews, Israel J. Grahame, and Alpheus S. Sharp; and from the Cincinnati College ot Pharmacy, Messrs. E. S. Wayne, W. S. Merrill, and W. J. M. Gordon.

GEO. B. WOOD.

Feb. 23*d*, 1860."

[Medical and Pharmaceutical Journals will please copy.]

Editorial Department.

Pharmacopœia Convention.—By reference to page 186, our readers will find an Announcement by Dr. Wood, of the next Meeting of the Convention for Revising the Pharmacopœia. The great importance of this Convention in giving authority to the National Pharmacopœia should induce a general attendance of delegates from the authorized Medical and Pharmaceutical bodies. There are certain points in regard to the new edition which should be discussed in the Convention at large, such as Weights and Measures, the Process of Percolation, the general opinion regarding the extent to which Fluid Extracts should be introduced, &c., that the committee to whom the labor of revision is committed shall have some idea of the wishes of the profession at large. It would be well if the President of the Convention would ascertain from the Washington delegates the place of meeting in Washington, and have it announced in the Journals for April and May, so as to avoid the annoyance to stranger delegates of not knowing where the Convention is to assemble.

The Jacob Bell Memorial.—The universal respect and admiration of the character of the late Jacob Bell, President of the Pharmaceutical Society of Great Britain, among the Pharmaceutists of England and Scotland, has vented itself in the idea of establishing a memorial in the form of two Scholarships in the School of Pharmacy of that Society, and already about $8000 have been subscribed for the purpose intended. Even the London College of Physicians have taken part in it, and have expressed their approval of the plan. No more appropriate offering could have been suggested in honor of a man whose sacrifices and devotion to his profession are perhaps unrivalled in the annals of Pharmacy; certainly none which would have been more in consonance with the feelings of the honored dead.

Modes of Rendering Cotton Fabrics Non-inflammable by Saline Impregnation.—Much attention has recently been attracted to this subject, owing to the frequent loss of life by the combustion of female dresses which has occurred in Great Britain. The Queen having set the example by practical experiments in the "Royal Laundry," made with solutions prepared under the direction of a scientific gentleman, others are now taking hold of the idea. We had intended to have published an account of the result thus far, in this number, but for want of space defer it till our next.

St. Louis, Mo., Feb. 10th, 1860.

To the Editor of the American Journal of Pharmacy:

Dear Sir—The annual election of Officers of the St. Louis Pharmaceutical Association took place on the 5th of January, at the Hall of the Association.

The retiring President, Mr. Eugene L. Massot, read his annual address. He states the Association to be in a prosperous condition, which is evidenced in the fact that the desire to obtain thorough pharmaceutical education is growing of greater importance, not only with the members of the Society, but also of the craft at large, which is the principal aim of this and all similar associations.

The following is the list of Officers for the present year (1860):

President—Enno Sander.

Vice President—S. D. Hendell.

Second Vice President—Thomas Tanton.

Recording Secretary—Wm. B. Parker.

Corresponding Secretary—Alex. Leitch.

Treasurer—Wm. H. Dornin.

Executive Committee—Wm. H. Dornin, E. L. Massct, Saml. D. Hendell, Thos. Scott, Theo. Kalb.

Committee on Progress of Pharmacy—James O'Gallagher, Wm. B. Parker, Alex. Leitch, T. Kalb, Wm. H. Dornin.

Committee on Unofficinal Formula—James O'Gallagher, Hubert Primm, Thos. Scott, E. L. Massot, Wm. B. Parker.

Yours respectfully,

ALEX. LEITCH, Corres. Sec.

Therapeutics and Materia Medica. A systematic treatise on the action and uses of medicinal agents, including their description and history. By ALFRED STILLÉ, M. D., &c., &c. Philadelphia, Blanchard & Lea, 1860. 2 vols. octavo pp. 1788.

The volumes indicated above have long been in preparation by their author; during more than ten years he has engaged himself in their elaboration from the mass of records left by medical observers in the past, and especially in the present century, on the subject of Therapeutics.

Although the title indicates descriptive Materia Medica as included in the scope of the work, the reader soon finds that both Materia Medica and Pharmacy occupy a very subordinate position. The author occasionally permits himself to go into detail in his description and history of drugs, but rarely enters into pharmaceutical details beyond the most concise statement of the constitution and mode of preparation of officinal compounds. He evidently does not intend this portion of the work to be used for reference, as a dispensatory or formulary, as the relative proportions and quantities of ingredients in the formulæ are frequently not mentioned. The reader, for instance, is informed at page 452, in speaking of "Liquor Ferri Iodidi:—"This preparation differs from the last, [the solid iodide of iron] by the addition of sugar to filtered liquor, which, also, is not evaporated. In this manner decomposition is prevented. The solution is of a pale green color, and has a strong inky taste." This description follows immediately after a succinct account of the Iodide of Iron, but in neither is any clue given to the proportion of salt in the solution. As this course is frequently adopted, it is clearly the object of the author to convey in general terms, an idea of the nature and characters of each pharmaceutical preparation, to aid the student or physician who may consult the work, to keep them in remembrance; whilst it is intended that for exact information in regard to manipulation and quantities, he should employ the Pharmacopœia or Dispensatory. In a word, the work is addressed to the Physician, not to the Apothecary, to the prescriber and not to the preparer of medicines; the great object of the book is to exhibit the action of medicines upon the human economy, both in its healthy and morbid conditions, and to point out when these agents may be most certainly and efficiently employed in curing disease. In pursuit of this end the author has devoted much time and research to ascertain the testimony of medical writers, pro and con, in relation to the curative powers of remedies, believing that "our knowledge of the usefulness of medicines rests altogether upon experience, but not upon that of any one man, however skilful, or of any age, however enlightened;" and "that their efficacy is attested by a multitude of witnesses, and is confirmed by time, which reduces the opinions of individuals to their just value, outlives the fashions of the day, and is unmoved by the prejudices of the schools. To experience, then, we must turn as to the ultimate and decisive arbiter of all questions respecting the curative powers of medicines, feeling assured that whenever the particular application of a remedy could be sustained by the testimony of the great Physicians of successive ages, our employment of it possesses the highest possible sanction."

The introduction includes general observations on the sources from which medicines are derived; the sources of knowledge in Therapeutics; the sources of knowledge respecting the action of medicines; the physiological, local, and remote action of medicines; the avenues by which medicines gain access to, and their effects in, the system; their curative action; their administration; the art of prescribing them; and lastly, their classification.

So far as we have observed Dr Stillé has no favorite theories to establish that have swayed his judgment in developing the subject; at every step we are struck with the careful and laborious research which has manifestly been employed to gather the views and experience of so many observers, with references to their original papers and volumes, a feature that will prove of great utility to the student who may desire to consult them. The work is written in a clear and classical style; no redundancy in words or expression mars his descriptions. The merit of the work as a treatise on Therapeutics, from the stand point of the Physician, we leave to our medical cotemporaries; it is for them to judge whether the author, in producing this new contribution to the medical literature of the United States, has succeeded in throwing more light on the important, but difficult and too often obscure, subject of the real action of medicines after ingestion; and whether his views of their real curative powers, as expressed in the testimony he has adduced in their favor or against them, accords with the experience of others. Viewing the work with a pharmaceutist's eye and judgment, we at first felt disposed to express the disappointment in which our examination had resulted, on finding that the author, on treating a subject which claims the aid of pharmacy at every step, should have so imperfectly represented the valuable influence it contributes in the successful prescription of medicines, as to leave untold so much that is important in officinal as well as in extemporaneous pharmacy. For instance, the art of prescribing medicines involves not only their adaptation to the disease treated, and to the particular condition of the patient at the time, as the author has well said; but also their compatible association, in the most eligible and least repugnant form. The best remedies often prove useless from the nausea they excite, and it certainly is an important, though not generally practised, part of the therapeutist's duty, to point out the most elegant and appropriate form for the extemporaneous or permanent association of drugs. The skilful Apothecary might often modify advantageously, the physical condition and sensible properties of the medicines he dispenses by prescription, were it safe and proper for him to assume the responsibility, which it is not;—and perhaps the knowledge to which we allude belongs more to pharmacy than to therapeutics; yet we believe it may properly enter into a work of the character of the present, and would greatly aid in improving the "art of writing prescriptions" as practised by many Physicians. But, on further reflection, we believe, that in taking this course the author preferred to refer his readers to the special treatises, rather than to enter on practical details, to elucidate which successfully would have involved a familiarity with the operations of practical pharmacy. For this reason we withhold any criticism in this direction, to which the work may be obnoxious, and with a firm conviction of the honest purpose of the author, and a high estimate of the learning and ability his production manifests, we most cordially commend it to the careful perusal of our medical brethren.

We had almost forgotten to say, that in point of mechanical execution and the evident care which has marked its progress through the press, the work is highly creditable to all concerned.

Introductory Lectures and Addresses on Medical subjects, delivered chiefly before the Medical Classes of the University of Pennsylvania. By GEORGE B. WOOD, M. D., LL. D., President of the American Philosophical Society, &c., &c. Philadelphia, J. B. Lippincott & Co. 1859. pp. 460.

The author of this volume, as his friends are aware, is about to retire from the active duties of the medical profession, in which he has so long and efficiently labored. Previous to taking this step, he determined to publish in a collective form many of the Introductory Lectures which have been delivered during his long career as a teacher; besides several addresses, biographical and otherwise, more or less relating to medical subjects. The first of the collection is an address to the members of the Philadelphia College of Pharmacy thirty-six years ago, at a period when its school of Pharmacy, in which the author at that time occupied the chair of chemistry, was in a very depressed state. The object of the address was to arouse the members of the Institution to a clearer appreciation of its condition, its duties, its powers, and in what way these should be exerted to fulfil the destiny, to which, in the mind of the writer, it was called. In concluding this address, which contains many excellent points, Dr. Wood uses the following prophetic remarks: "With great confidence we may anticipate, not perhaps an immediate, but certainly a high degree of ultimate prosperity for the Institution. In the progress of years, it will out-grow its present sick and fragile condition. Strong internally by its own regulations, and externally by your unanimous support, it will be enabled to exercise over your profession an authority equally beneficial to yourselves and to the community. Provided with ample means of instruction, and holding out strong inducements to studious application, it will diffuse copious and accurate knowledge among the apprentices to your art, and will greatly elevate your standard of scientific attainments. Finally, when the division of the professions shall have become more general, and apothecaries shall be required, not only in our larger towns, but in almost every village of the country, it may widen the sphere of its attraction far beyond the limits originally contemplated, and render the city of Philadelphia the centre of Pharmaceutical, as it has long been of medical instruction to the whole extent of the Union."

In glancing over the medical addresses, one is struck by their apparent unity of design—by the relationship they bear to each other as parts of a whole—though delivered at periods and under circumstances greatly differing. The first, on the history of the Materia Medica, and the next, on the history of the Materia Medica in the United States, are specially interesting to the apothecary, as throwing much light on the history of our art, and on the influences which in this country have tended to its development.

By the frequent employment of foot-notes, the author has added much to the interest of the subjects discussed by explanations and comments. One of these, appended to an address to the Pharmaceutical Graduates in 1833, referring to the then rising influence of the College of Pharmacy in Philadelphia, we cannot refrain from transcribing.

> "Justice requires that some allusion should here be made to the services of a gentleman, to whom the Pharmacy of this country is greatly indebted; I refer to Daniel B. Smith, formerly President of the Philadelphia College of Pharmacy. Standing among the first apothecaries of his time in literary and scientific attainment, peculiar skill in his art, and general reputation, he entered zealously into the movement which originated and sustained the

College of Pharmacy; and, by his own written contributions, the encouragement which he extended to the efforts of younger men, and the measures set on foot, or ardently supported by him, for the improvement in various ways of the profession to which he was attached, he contributed, I think, more than any other one individual, to the impetus which has carried the pharmacy of this country to its present relatively high position. Should this notice reach him in his retirement, the author hopes that he will receive it kindly, as the testimony of one who has known him for more than forty years, has always esteemed him highly, and entertains a grateful sense of the early aid and encouragement extended by him to his own professional labors."

Two lectures, descriptive of the state of the medical profession in Great Britain and on the Continent of Europe, the results of the author's observations during his transatlantic visits, are particularly interesting to the general medical reader. The biographical memoirs of Dr. Joseph Parrish and Dr. S. G. Morton—men whose deeds on the fields of medicine and science have secured them a grateful remembrance in and out of the medical profession—fitly conclude the volume. From these, as from others of the addresses, it would afford us much gratification to quote, but the small space at command constrains us to forego the pleasure. The book is handsomely printed, and is dedicated to the Graduates of the University of Pennsylvania of the Classes for 1836 to 1860 inclusive.

A Medico-legal Treatise on Malpractice and Medical Evidence, comprising the elements of Medical Jurisprudence. By John J. Elwell, M.D., Member of the Cleveland Bar. New York, John S. Voorhees, No. 20 Nassau St., New York, 1860; pp. 588.

We acknowledge the reception of this work from the publishers just as we were going to press, and too late to notice it in this number.

The Chemical News, with which is incorporated the Chemical Gazette, London, in 16 page numbers, quarto, issued weekly.

This work succeeds the Chemical Gazette, so long and favorably known as a depository of scientific and industrial chemistry, and so ably conducted by Dr. Wm. Francis. Its successor is got up in a more popular style, evidently addressed more to the masses than was the "Gazette," which was noted for its strict adherence to the publication of chemical papers of a scientific cast. The Chemical News embraces Chemistry, scientific and technical, Pharmacy, Toxicology, notices of patents and books, correspondence, laboratory memoranda, etc., and is conducted by Wm. Crookes.

Notes and Queries, a medium of intercommunication for Literary men, Artists, Antiquaries, Genealogists, &c., London, 24 pp. quarto, weekly.

The reception of a number of this periodical is acknowledged from Daniel Hanbury.

THE

AMERICAN JOURNAL OF PHARMACY.

MAY, 1860.

ANALYSIS OF COMMERCIAL GLACIAL PHOSPHORIC ACID.

By John M. Maisch.

Within a few years past, phosphoric acid and its compounds have attracted the attention of medical practitioners, and are now extensively used, frequently in the form of solutions and syrups, in which free phosphoric acid is employed for keeping the earthy and metallic phosphates in solution. In many of the formulas of these preparations, the glacial phosphoric acid, as it occurs in commerce, is assumed to be the monohydrated HO, PO_5; but those who have made them will have frequently noticed that sometimes the phosporic acid employed is unable to dissolve the same quantity of phosphates which at other times is taken up by it. As a reason for this, we generally assign the presence of variable proportions of fixed earthy matters, which cannot be volatilized by the fusion of the acid; and it is a fact that almost all of it, the way we meet with it in commerce, yields a white precipitate on being oversaturated with ammonia.

At the suggestion of Professor Procter, I have taken up the subject with the view of ascertaining the nature and the amount of these impurities, and the state in which the acid exists ordinarily.

In the first place my inquiries were directed to obtain glacial phosphoric acid from different manufacturers; in this I was unsuccessful. By inquiring of a number of friends, I ascertained that they are all using an article made by Merck, of Darmstadt, a number of whose chemicals enjoy a well merited reputation among us. This induced me to select at random from a larger lot of this acid, three specimens, which were washed with cold water, and dried by means of bibulous paper.

On neutralizing an aqueous solution of glacial phosphoric acid, to effect which the generation of heat has been carefully avoided by placing the dish in cold water, ammonia will sometimes throw down no, or only a slight, precipitate, which is increased by the subsequent application of heat. The precipitates thus collected and heated amounted to 8.18, 4.16, 0.80 per cent., and in a fourth instance no precipitate at all was obtained. In the first case I had collected from 550 grs. of acid 45 grs. of precipitate, and intended to use this for a quantitative analysis; but meeting with an accidental loss of a portion of it, I am only able to give the quality of these impurities.

The precipitate was dissolved in diluted muriatic acid, and the solution filtered; a residue of silicic acid remained on the filter amounting to 1.5 grs. = 0.273 per cent. of the phosphoric acid, or 3.333 per cent. of the weight of the precipitate. The filtrate was mixed with strong alcohol, and sulphuric acid dropped in as long as a precipitate was produced, which was separated by a filter and well washed with alcohol. The acid filtrate, from which the alcohol had been evaporated, yielded a granular white precipitate on being oversaturated with ammonia, which was insoluble in chloride of ammonium; carbonate of potassa produced no change in the cold, but, on boiling, a white precipitate, which was soluble in acetic acid, and this solution was not precipitated by oxalic acid, but yielded a white granular precipitate on the addition of chloride of ammonium, ammonia and phosphate of ammonia in succession. The filtrate, therefore, contained phosphate of magnesia.

The residue on the filter was wholly soluble in a large quantity of water, and this solution was affected by reagents in the following manner: Phosphate of soda, turbid; after a while, white precipitate; oxalate of ammonia, immediately a white precipitate insoluble in acetic acid; ammonia, ferro- and ferridcyanide of potassium did not disturb it. These reactions prove the presence of lime, and the absence of alumina, and of iron, and other heavy metals.

The whole precipitate was therefore composed of silicic acid, phosphate of lime and phosphate of magnesia. I must mention here that a portion of the same crystals was tested with chloride of barium and caustic potassa, but neither sulphuric acid nor ammonia was found in any of the specimens examined.

When the glacial phosphoric acid, dissolved in cold water, is immediately oversaturated with ammonia, filtered from the precipitate, and mixed with a solution of chloride of ammonium and magnesium, a precipitate of ammonio-phosphate of magnesia occurs only of that portion of the phosphoric acid which has, by the action of a moist atmosphere and the consequent gradual absorption of water, been converted into the terhydrate or the common phosphoric acid; an excess of the double chloride produces in the filtrate no further precipitate, until it is heated to boiling. By setting the solution aside, the meta- or pyrophosphoric acid is gradually converted into the common tribasic acid, but this change is effected in a short time on the application of heat. To determine whether all the acid has been changed in this manner, it will suffice to add more of the double chloride to the ammoniacal solution and boil again; this must be continued until a precipitate ceases to be separated.

But inasmuch as meta and pyrophosphate of lime and magnesia are kept in solution by the corresponding phosphate of ammonia, it will be necessary to boil the original solution of the acid for some time, allow it to cool and supersaturate it with ammonia. The filtrate must then be repeatedly boiled, and some ammonia must be added to the cooled liquor until no further precipitate occurs. We may then be sure that all the earthy phosphates have been separated. The combined precipitates are now exposed to heat until they cease to lose weight; their weight is then deducted from the original weight of the phosphoric acid, and the remainder may be looked upon as the weight of pure hydrated phosphoric acid, provided that in the beginning we have satisfied ourselves of the absence of sulphuric acid and ammonia. Though many works on chemistry recommend to test for nitric and hydrochloric acids, I have never, either on any former or the present occasion found either of these two; but sulphuric acid, I have in one or two cases met with, not however in Merck's.

The ammoniacal solution of phosphoric acid is then precipitated with a solution of chloride of ammonium and magnesium, and after standing for several hours, filtered. The precipitate is washed with a diluted solution of ammonia, until the washings, when oversaturated with pure nitric acid, produce no precipitate in nitrate of silver.

To determine from the precipitate the quantity of anhydrous phosphoric acid, I have followed two ways ; if its quantity was large, I have dried it upon a brick tile at ordinary temperature, ascertained its precise weight, ignited a convenient portion of it, and then calculated the weight which would have resulted from the ignition of the whole. If the quantity of the precipitate was small, the whole of it was ignited together with the filter, the amount of ashes of which was ascertained by incinerating a portion of the same sheet of paper, and deducting the weight of ashes from the whole weight obtained. The result in either case is pyrophospate of magnesia $2MgO, PO_5$, which contains 63.33 per cent. of PO_5.

The following table contains in the first column the amount of phosphoric acid employed ; in the second, the weight of impurities ; third, the percentage of the same ; fourth, the weight of $2MgO, pPO_5$; fifth, the weight of PO_5; sixth, its percentage of the pure hydrate ; and in the seventhcolumn the percentage of the free PO_5 in the specimen.

I.	II.	III.	IV.	V.		VI.	VII.
550 grs.	45.0 grs.	8.1818	609.86 grs.	386.12	grs.	76·46	70.20
100.75 "	0·8. "	·794	122.77 "	77.75	"	77.79	77.19
48.20 "	none	——	63.22 "	40.04	"	83.48	83.48
——	——	4.16	——	——		——	——

Pure metaphosphoric acid HO, PO_5 contains 88.806 per ct. PO_5, and the best specimen which I have examined contains 5.32 per ct. less, while between the highest and lowest there is a difference of 13.28 per ct. in the available acid, and after the deduction of the earthy phosphates the difference is still 7.02 per ct. It cannot be doubted that the large amount of impurities found in the first specimen is accidental, and probably derived from the vessel in which the phosphoric acid was fused ; the purity of the other two specimens taken out of the same jar, speak in favor of this supposition, and it appears to me, on account of this great difference, as if most likely different portions of the acid, fused at the same time in one vessel, may contain a variable proportion of impurities.

From the amount of water alone no conclusion can be arrived at as to the proportion of the three phosphoric acids present at the same time. To ascertain this, an acid, known beforehand not to contain any impurities, after its solution in cold water and over-saturation with ammonia, may be precipitated with chloride of ammonium and magnesium ; this precipitate will contain all the common phosphoric acid. The acid of the filtrate is then to be converted into the ordinary variety, and precipitated as before; this precipitate will now contain all the meta and pyrophosphoric acids, the amount of each of which can be easily calculated from the remaining weight after the deduction of the terhydrate.

Philadelphia, *March*, 1860.

ON THE RESINOUS EXUDATION OF LIQUIDAMBER STYRACIFLUA.

By William Pryor Creecy, of Mississippi.

(An Inaugural Essay, presented to the Philadelphia College of Pharmacy.)

The attention which this resinous product, and the interesting tree from which it is derived, has already received from pharmacologists, has induced me to make it the subject of the investigations which follow, with a special view to ascertain the nature of the volatile acid or acids which give it a claim to be classed among Balsams.

The investigations of M. Bonastre, and of Wm. Hodgson, Jr., as quoted by Dr. Wood in the U. S. Dispensatory, attribute to this drug benzoic acid, as a constituent, and according to the last named chemist, it is in the proportion of 4.2 per cent.; several other constituents are also noted. The experiments of Mr. Daniel Hanbury, however, tend to show the absence of benzoic acid and the existence of cinnamic acid in this balsam, and all the others derived from this genus.

The specimen examined was from the State of Mississippi, where the "Sweet Gum" tree grows to the height of near 100 feet, and abounds in its peculiar resinous ingredient. When the trees are "belted," preparatory to being felled in clearing the land, the balsam exudes very abundantly, and thickens to a semifluid consistence; the outside of the masses becoming dry and hard.

The color of the liquidamber juice when fresh and pure is a transparent yellow, resembling that of balsam of fir. But as it thickens it becomes opaque and white, gradually changing to a dirty brown, interspersed with tears of a pure white color. Its odor is characteristic, resembling styrax, which in fact it much resembles in all its sensible properties. Of the numerous experiments made upon this balsam, the following are selected as the most important:

First.—One thousand grains of the balsam were boiled in water with an equal weight of hydrate of lime, for some hours, the decoction filtered while hot; on cooling, a crystalline product separated, which was collected on a filter and washed; its weight when dried was thirty-one grains.

Redissolved the mass in hot water and treated with muriatic acid in slight excess, a scaly crystalline white precipitate was separated on cooling, collected on a filter and dried. The precise weight of this was fifteen grains.

TESTINGS.—On heating a small portion of the product with a solution of chlorinated lime, the characteristic odor of essential oil of bitter almonds was evolved. Heating with a mixture of bichromate of potassa and sulphuric acid caused the same odor of oil of bitter almonds to be more strongly developed.

A small portion of the product when moistened on a piece of litmus paper gave an acid reaction.

It is almost insoluble in cold water. Soluble in about 24 parts of boiling water, and soluble in alcohol and in ether.

Second.—Subjected two ounces of the balsam to three successive distillations in water, saturating the solution with chloride of sodium three times and distilling two-thirds of the mixture each time. The last distillate had the agreeable and fragrant odor, characteristic of the balsam; this was shaken up thoroughly with ether, the ethereal solution separated, and on evaporation yielded globules of an oily nature, possessing a very aromatic odor, and sharp pungent taste.

TESTINGS.—A drop upon bibulous paper was evaporated by the heat of an alcohol flame, leaving no stain, but retaining the odor persistently.

The product is soluble in water, in alcohol and in ether, and gives a slight acid reaction with litmus.

Third.—To two ounces, troy, of the balsam digested in a pint of alcohol and filtered, muriatic acid was added until it ceased to yield a precipitate of resin. This resin, which collected in a soft mass, was removed, washed by kneading with cold water till it was free from acid, and assumed a light buff color; it possessed a very slight odor, reminding of the balsam, and weighed five and one-half drachms. The clear acid liquid, from which the resin was separated, being transferred to a retort, was distilled with the constant addition of water till nearly all the alcohol was distilled over. The distillate contained a deposit of a semi-concrete substance soluble in ether. This distillate was treated with caustic potash until decomposed, heated to the boiling point, filtered and supersaturated with muriatic acid. On cooling, a crystalline product separated, of a reddish hue and very little odor.

The residue removed from the retort was filtered while hot; on cooling it deposited a small amount of a reddish crystalline powder, resembling that obtained from the distillate.

TESTINGS.—This red powder was soluble in hot water, in alcohol, and in ether. On the addition of solution of chlorinated lime and heating, no bitter almond odor was evolved.

Bi chromate of potassa and sulphuric acid heated with a portion of the powder gave no bitter almond odor.

Fourth.—Subjected half an ounce of the balsam to sublimation, but, owing to the use of an imperfect apparatus, was only successful in obtaining a few grains of the sublimed acid. This acid was in white crystalline needles, much like benzoic acid, and gave no odor of bitter almonds with the chlorinated lime.

SUMMARY.—From these experiments the inference may be drawn that although the predominant acid contained in Liquidamber Styraciflua is undoubtedly cinnamic acid, yet it is probably associated with a small proportion of benzoic acid.

It appears also to contain a volatile odorous principle, with an acid reaction, soluble in water, alcohol and ether, and a hard resin in the proportion of about 30 per cent.

Philadelphia, December, 1859.

NOTE ON COWRIE RESIN.

By E. DONNELLY, M. D.

Cowdie, Kaurie, Cowrie, Kauri, or Australian Dammar Resin.

This resin is the product of *Dammara Australis* of some authors, and of the *Agathis Australis* of others; it is familiarly called Kourie tree by the colonists of New Zealand, and is one of the noblest trees of the Pinaceæ order, often attaining a height of over two hundred feet, with a trunk free from knots, light, compact, durable and admirably suited for making the best masts for ships of any tree in the world. This tree, owing to its great height, is generally selected by the Australian honey-bee,—a small stingless insect, not as large as our common house-fly—to form its honey-nest, thinking to be here secure from the lynx-eyed native, who is always on the look-out for the mellifluous treasure, which to him is an article of considerable importance, both as food and to make his favorite intoxicating drink called Bull. But the most singular part of this honey business, is, that the negro remains below, and sends his *gin* to procure the coveted prize, and she with the most astonishing dexterity and courage ascends to the dizzy height of over two hundred feet, secures the honey-nest, places it in a calabash suspended from her neck, descends with the fruit of her labor, and lays it at the feet of her sable lord. Cowrie is obtained by making incisions in the trunk of the tree, which exudes the resin in a liquid form in considerable quantities; it is allowed to harden, and then collected in bags for exportation. The natives use it as a masticatory when they cannot procure their favorite one, called by them "mimi-ha" or kowrie tauhiti. Kowrie, in the language of the natives, means the resin of the kowrie pine, and "tauhiti" at a distance or from a distant part. The kauri tauhiti is perfectly black, brittle, with a shining fracture, and a somewhat aromatic bituminous odor, it becomes soft with the heat of the mouth, burns with a clear flame, and waxy odor. It is found in masses on the beach near North Cape, and is a species of bitumen, thrown up no doubt, by a subterranean force, similar to what takes place on the coast of Terre Firma at Cumana. Kowrie resin, as found in commerce, is in pieces of various sizes and color, the latter varying from a light yellow in the best varieties, to a dark brown in inferior sorts. "The specific gravity of the light colored variety is 1.040, that of the dark 1.062. Fusing point 255°; when burned it leaves .424 of an ash containing lime and sulph. acid. A portion of it (57.33 per cent.) is dissolved in alcohol with acid properties, dammaric acid $C_{40} H_{30} O_7, HO$. A portion remains undissolved, dammarane

$C_{40} H_{31} O_6$. By distillation an amber-colored oil, dammarol, is obtained $= C_{40} H_{28} O_3$, or the resin deprived of 3 atoms of water. Distilled with lime it yields dammarone $C_{38} H_{30} O$, by the removal of 2 atoms of carbonic acid, and 1 atom of water."—(*R. H. Thompson.*) The only use to which kowrie resin has been applied is that of making varnish, and it would appear that it is only used in this country for that purpose, as every author I have consulted (who speaks of kowrie) makes mention of the Americans using it extensively as a varnish. I have been told by persons in the varnish trade, that nearly all of that article which comes from New York to the Philadelphia market, is made from kowrie resin. As a varnish it is not so durable as that made from copal, and is very difficult to work; but still it makes a very good common varnish, drying quickly, and of a lighter color than the varnishes usually made from resin and other impure substances. Its price varies from 4 to 6 dollars per 100 lbs.

ON PILLS OF IODIDE OF IRON.

By William Procter, Jr.

In the formula at present in the Pharmacopœia, these pills are directed to be made by triturating together iodide of potassium and proto-sulphate of iron until double decomposition ensues, when by aid of sugar and tragacanth a pill mass is formed and divided into pills. The ready decomposition of these pills, thus made, has rendered this recipe nearly obsolete. Henry W. Worthington, in 1843, published a formula in which a solution of the iodide was mixed with tragacanth paste and honey and evaporated to the pilular consistence. His pill mass, owing to its elasticity, was quite difficult to divide into pills, and when made they easily lost their spherical shape. Within a few years past the pills of M. Blancard of Paris, owing to the perfection of their preservation, have come much into use, but it is certainly to be regretted that in a preparation so much used as this salt, we should be compelled to send to France to get it made into pills.

After various trials, with the view of improving the method of making these pills, the following recipe has resulted, which, when followed with ordinary care, produces a pill entirely satisfactory to the physician, as regards the entire absence of *free* iodine, its tastelessness, and its property to keep quite well.

Pilulæ Ferri Iodidi.

Take of Iodine, half an ounce;
Iron filings, two drachms;
Water, ten fluid drachms;
Sugar, in fine powder, an ounce;
Althæa root, in powder, half an ounce;
Gum Arabic, in powder;
Powdered Iron, (iron by hydrogen) each a drachm.

Mix the iodine with a fluid ounce of the water, in a thin glass vial, add the iron filings, and agitate them until the solution, on settling, has a clear green color. Mix the sugar, gum Arabic, and powdered iron in a small porcelain capsule, and filter into it the dense solution of iodide of iron, yet hot, from the reaction, observing to wash the filter with the remainder of the water. Then by means of a moderate heat with constant stirring, evaporate the moisture until, on the addition of the powdered althæa, the mixture acquires the consistence proper for a pill mass, and divide it into three hundred pills, which should be rolled until they are perfectly globular.

To preserve the pills from oxidation dissolve a drachm of hard tolu in a drachm and a half of pure ether, and pour it over the pills contained in a deep porcelain capsule, and by means of a circular motion agitate the pills until they are all coated with tolu; then pour them on to a plate and separate them from each other until the ether evaporates, and they cease to cohere together. They should then be exposed in a paper box, in a dry atmosphere, until the varnish hardens, when they may be put up in bottles, ready for use.

Thus made, pills of iodide of iron are shining, black, globular masses, each pill containing about a grain of iodide of iron, perfectly free from iodine odor, and keep in the air without any tendency to deliquescence. Gum arabic is more suitable than tragacanth for this pill. It gives the necessary cohesiveness, without the elasticity and toughness, which are apt to accompany the use of tragacanth, and which renders the mass difficult to form into pills. If the operator finds, after the addition of the althæa, (which from its gummy nature, gives a peculiar consistence to the mass,) that the mass is too soft, the heat must be carefully continued until a pill when rolled out will retain its shape when cool. The introduction of the powdered iron insures the combination of all the iodine during the evaporation, and is in such excess as to continue its preservative influence after the ingestion of the pill.

The coating of tolu, whilst it does not prevent the action of the gastric fluids in disintegrating the pills, enables them to reach the stomach without offending the palate with the disagreeable metallic taste properly belonging to the salt.

ON COPPER AMALGAM.

By H. Dussance.

New Lebanon, N. Y., February 24th, 1860.

To the Editor of the American Journal of Pharmacy:

I have read in many scientific and medical Journals of the discovery of a new alloy, by Mr. Oersheim, which alloy has plastic properties, and is an amalgam of copper. This alloy is not new, for in 1853 Professor Peligot, in his lectures at the Conservatoire Imper. des Arts et Metiers, at Paris, spoke of it. At that time I was his assistant, and prepared great quantities of it, and analysed it.

This alloy presents the remarkable property of being soft when recently prepared, and after a short time it becomes so hard that it is difficult to break it to analyse it. Dentists used it to fill teeth, but I believe its use was abandoned. On account of its property of being soft at first, its greatest use is for the moulding of medals. The best way to prepare it is the following:

1st. Take sulphate of copper and dissolve it in water acidulated by a few drops of sulphuric acid; put in this bath a sheet of iron perfectly clean; the copper is precipitated in the form of a reddish powder.

2d. Wash that powder quickly with hot water, and after mixing it well in a mortar with a few drops of nitrate of mercury, wash it well again with hot water.

3d. Add mercury to it in a mortar, and mix it well, until it has the form of a paste, that can be worked with the fingers.

4th. Wash well with hot water till the washing liquid is perfectly clear.

5th. Press the alloy in a deer-skin till all the excess of mercury is out, and expose to the air. In less than hour it becomes very hard.

A singular property I must notice, is the action of zinc on this alloy; if the mercury contains a little zinc, the alloy comes very hard, but it breaks in pieces by the least knock.

Here is the analysis of it:

Analysis in the ordinary state.

Copper,	25.75	25.81
Mercury,	74.25	74.19
	100.00	100.00

Density 11.48.

Analysis when soft.

Copper,	25.43
Mercury,	74.57
	100.00

Density, 11.033.

Analysis after it has been soft and hard again.

Copper,	25.48
Mercury,	74.52
	100.00

Density, 11.036.

Such is the composition of this alloy, which is given for a new discovery, and which was described seven or eight years ago, and was called *alloy of the dentists.*

NOTES ON BENZOIC ACID AND SOME BENZOATES.

By John M. Maisch.

Benzoic Acid.—When benzoin is treated for benzoic acid by Mohr's process, it is necessary to gradually increase the heat, and if the process is continued until vapors cease to rise, the sublimate generally contains a variable quantity of empyreumatic matter, to which it owes its odor, and which likewise imparts color to the product. The acid ought to be free of color, and to obtain it thus a second sublimation is often found necessary. In order to avoid this, it is well to have two paper hoods ready made to fit the subliming vessel, and remove the first before it has been requisite to raise the temperature. At about 300° F. a quantity of benzoic acid may thus be obtained, which is perfectly white, of a high silky lustre, possessing but little of the empyreumatic odor, and when dissolved in an alkali, affording a colorless solution; its appearance and chemical behaviour prove it to be far superior to the article usually met with in commerce.

If the sublimation is now continued, the acid obtained subsequently is found to contain empyreumatic coloring matter, as the process proceeds; it may be freed from it by a second sublimation. This increase of empyreumatic products in the sublimed acid is not owing merely to an increase of the temperature, but principally to the fact, that the bibulous paper stretched over the vessel has become saturated with the same, and is unable to absorb and retain any more at the temperature to which it is exposed. If during the process the paper is replaced by a fresh piece, the acid sublimes as white as before, and with as little odor adhering to it. This empyreumatic aroma is frequently considered essential for the medicinal value of the acid, and such careful treatment of the balsam would therefore be inadmissible when the acid is to be used in medicine. But I believe that the product which has been obtained by a slow sublimation at a low temperature, will, by its beauty and purity, fully repay for the little trouble incidental with its collection.

Benzoate of Soda.—When benzoic acid is almost neutralized with carbonate of soda, a colorless solution results, which, when sufficiently concentrated, yields, on cooling, small thin needles in starlike groups; if somewhat further evaporated, the solution assumes a brownish color, and may remain liquid for a day or two without separating any crystals. If still farther evaporated the crystals form very slowly in the syrupy liquid. They are very long, needle-shaped, and commence to become opaque, while still in contact with the liquid, together with which they dry to an opaque mass without crystalline structure. When removed from the solution and rapidly pressed between bibulous paper, they preserve only in some measure their original shape. The brown syrupy liquid as obtained by evaporation, dries to the last drop to a white opaque mass. Benzoate of soda is best obtained in crystals, by evaporating its solution, only so far that on cooling it will just commence to crystallize, and to expose it gradually to a lower temperature; the crystals thus formed by cooling to 32°, are to be removed from the thin liquid, and rapidly dried by pressing them between folds of bibulous paper.

Benzoate of Iron.—According to Trommsdorff and Berzelius, the ter-benzoate of iron is formed by dissolving recently precipitated sesqui-oxide of iron in an aqueous solution of benzoic acid; the yellow needles are decomposed by water and alcohol, leaving a basic salt behind.

When a concentrated solution of benzoate of soda is added to the officinal solution of ter-nitrate of iron, a voluminous orange colored precipitate is obtained, which is immediately thrown on a filter; when the liquid has nearly all passed, a small portion of water is added to displace most of the ferric solution, and the precipitate is then allowed to dry, spread out upon a brick tile. This was used for analysis.

Five grs. were heated in a porcelain crucible; a little water was first given off, then benzoic acid sublimed in small white crystals; on increasing the heat, a brown liquid collected on the cover, which congealed into brown colored scales having the empyreumatic odor and taste of benzoic acid; the residue was repeatedly moistened with nitric acid, and exposed to heat until vapors ceased to be given off; it then weighed 0.85 grs. which is equal to 17 per cent.

Ten grs. of the benzoate of iron was repeatedly treated with a large excess of ammonia, the sesqui-oxide of iron was well washed upon a filter, then washed into a tared capsule, and heated until it ceased to lose weight; its weight was 1.6 grs. =16 per cent.

Into a glass tube weighing 48.1 grs., 3.08 grs. benzoate of iron, were introduced, and exposed to the heat of a water bath for half an hour; the loss was only about 0.02; the tube was now introduced into a sand bath of 260°, and kept at this temperature until aqueous vapors ceased to be condensed in the upper part, it now weighed 50.85 grs.; the loss therefore amounted to 51.18—50.85, =0.33 grs. or 10.71 per cent.

From these data, the following formula is calculated for this ter-benzoate of iron.

Fe_2O_3	80	16.91	16.50
$3C_{14}H_5O_3$	339	71.67	71.44 (see below.)
6 HO	54	11.42	10.71
$Fe_2O_3,3C_{14}H_5O_3+6HO$	473	100.00	

Ter-benzoate of iron, as thus obtained, is in a light powder, of a beautiful orange color, permanent in the air, turning brown between 270 and 280°; it fuses and yields when carefully heated, at first pure benzoic acid, afterwards an empyreumatic liquid of an acid reaction, which appears to be principally the same acid, and congeals in scales. Water and alcohol dissolve a portion of it, probably an acid salt, and leave a basic salt behind.

Benzoic acid is scarcely used in medicine, except in paregoric and occasionally in ointments; when taken internally, it is stated to act as a stimulant. Combined with iron as in the above salt, it might perhaps prove useful in the hands of the physician. The salt has very little taste, not at all ferruginous, and would certainly be preferable to the acid, or the alkaline salts which possess a marked acrimony.

When the above ter-benzoate is desired, the directions above given for its preparation should be closely followed; the filtrate from the precipitate separates in the course of two days, another precipitate, which dries upon the filter in a yellowish powder, and in orange brown scales, evidently a mixture of different compounds; and after three weeks, more of the light powder is deposited. The drying is to be accomplished in thin layers upon a brick tile.

Bibenzoate of Ammonia.—In order to determine as near as possible the quantity of benzoic acid in the iron salt, the above filtrate from the treatment of the ferric benzoate with ammonia was evaporated, and kept at a temperature of below 190° F., until a dry mass remained behind and the loss of weight ceased. The residue weighed 8.25 grs., it evolved ammonia when treated with an excess of caustic potassa; and Wackenroder's observation, which has been doubted already by Liebig, that on the spontaneous evaporation of a solution of benzoic acid in carbonate of ammonia, pure benzoic acid is separated in crystals, is thereby proven to be incorrect. Assuming the experiments of Berzelius, that a bibenzoate of ammonia is thus formed, to be correct the above 71.67 per cent. or 7.167 grs. of $C_{14}H_5O_3$, would require of NH_4O 0.824 grs. and of HO 0.285 grs. making the required whole weight of the salt, $7.167+0.824+0.285=8.276$, with which the actual weight of 8.25 closely agreed. Accordingly the formula for anhydrous bibenzoate of ammonia is calculated as follows:

NH_4O	26	9.96
HO	9	3.45
$2C_{14}H_5O_3$	226	86.59
$NH_4O,HO,2C_{14}H_5O_3$	261	100.00

and 8.25 grs. of bibenzoate of ammonia as found above, contain $\frac{8.25\times86.59}{100}=7.143675$ grs. $C_{14}H_5O_3=71.437$ per cent. of the above benzoate of iron.

This experiment verifies on the one hand, the above formula for the neutral benzoate of iron, and tends to prove on the other hand that an anhydrous bibenzoate of ammonia remains behind on evaporating a solution of benzoic acid in ammonia, at a temperature below 190°; the influence of a higher heat had not been tried.

Philadelphia, March, 1860.

ON THE ROOT OF PODOPHYLLUM PELTATUM.

By William G. Parrish.

(Condensed from an Inaugural Essay.)

The author set out in his investigations with the intention of determining the composition and efficiency of this root, as obtained at several periods of the year. On the 25th of June, a pound (7000 grains) of the fresh root was collected and dried; the dry root weighed 3076.5 grs. Of this, 1920 grains was powdered, and extracted by percolation with alcohol, the tincture evaporated to a syrup, poured into cold water, and the precipitated podophyllin washed with water on a filter and dried. It weighed 60 grs.

On the 13th of July, another pound of the fresh root was collected and dried. It was larger and more vigorous in its growth than the first, apparently, but it yielded but 2691 grs., showing a greater preponderance of water, as the cause of its increased size. Of this the author took 1920 grs. and treated it by percolation with alcohol, etc., as in the previous experiment, and obtained 67 grs. of podophyllin.

On the 19th of August a third pound was collected and dried, the dry residuum weighing but 1968.75 grs. and presented a more shriveled appearance. 1920 grs. yielded seventy grains of podophyllin, when treated as before described.

On the 17th of September, the fourth pound was collected and dried. The loss was about the same as the last, and 1920 grs. of the dried root yielded 74 grs. of podophyllin.

These results may be tabulated as follows:

7000	grs.	podophyllum	collected	June 25,	lost by	drying	3923.5	grs.
7000	“	“	“	July 13,	“	“	4309.	“
7000	“	“	“	Aug. 19,	“	“	5031.25	“
7000	“	“	“	Sept. 17,	“	“	5031.	“

After making a due allowance for the loss by drying, so as to get at the actual amount of resin (podophyllin) yielded by each pound, the following tabulated statement exhibits the proportion of resin in each specimen.

7000	grs.	podophyllum	collected	June 25,	contained	96	grs.	resin	or	1.37	p. ct.
7000	“	“	“	July 13,	“	94	“	“		1.34	“
7000	“	“	“	Aug. 19,	“	71	“	“		1.01	“
7000	“	“	“	Sept. 17.	“	76	“	“		1.08	“

The author then took 100 grains of podophyllum resin, as prepared by the foregoing, experiment, treated it with ether till exhausted, leaving a residue of only 15 grains, whilst by evaporating the ether 85 grs. of resin, soluble in that liquid, resulted.

The author then experimented with the view of ascertaining the relative activity of the two resins, and says: “I satisfactorily proved by repeated experiments upon myself, and associate in the store, that the alcoholic [resin] was much the stronger cathartic, and not the ethereal, as stated by former writers on this drug. I took two grains of the resin, soluble in alcohol, which proved an active cathartic, causing eight copious stools during one day, whilst two grains of the resin, soluble in alcohol and ether, only produced one stool."

NOTE.—The results obtained by the author differ in several respects from those of other experimenters. In a recent trial of a process for podophyllin, with a view to the U. S. Pharmacopœia, we obtained 103 grs. of crude resin, from 1920 grains of the dried root, collected in the autumn, which is equal to 4.3 per cent. of the dried root. Mr. Tilden (see Proceedings Amer. Pharm. Assoc. 1859, page 334,) in one analysis obtained 5.25 per cent. of crude resin from the root collected in April, of which 2.85 per cent. was resin, soluble in ether, and in the other, 5.68 per cent. of which 5.51 per cent. was soluble in ether. In the above four analyses of Mr. Parrish, the percentage of the crude resin in the dry roots was 3.12 per cent., 3.49 per cent., 3.64 per cent. and 3.85 per cent., respectively, in the order above indicated. As his examinations were made after Mr. Tilden's spring root analysis, and before his autumn analysis and ours, we must infer that the first was too late, and the last too early, to get the largest percentage of resinous product. As regards the percentage of resin, soluble in ether, the experiment is imperfect, from the fact that the crude resin used must have been a mixture of that obtained by at least two experiments, as in no instance did he get more than 74 grs. of the podophyllin. In regard to the results of the therapeutic effects of the two resins, we can only say that the results of Mr. Parrish agree with those of John R. Lewis, (Amer. Jour. Pharm. vol. xviii., page 169,) the original experimenter on this principle, and differs from those of John W. Cadbury, (ibid., vol. 30th,) and Harvey Allen, (ibid., vol. 31,) who found the ethereal resin the more active. As the medicinal crude resin of commerce contains them both, it is perhaps of less importance to determine this point; but as Mr. Tilden's results show conclusively that the relative proportion of the two resins varies very considerably with the season of collection, it is certainly desirable to determine the following questions:

1. At what season of the year does the dry podophyllum root afford the most resin?

2. Which of the two resins of podophyllin, as separated by *non-alcoholic* ether, is the more active cathartic?

3. At what period of the growth of the root is the more active resin most largely developed?

4. Do roots of the first year's growth from the seed possess as much resin and cathartic power as older roots, and if not, how old should the root be to be most valuable for medical use.—EDITOR AMER. JOUR. PHARMACY.]

ON THE SEEDS OF PHELLANDRIUM AQUATICUM.

By Charles Fronefield, Jr.

(Extracted from an Inaugural Essay.)

The *fine-leaved water hemlock* belongs to the *natural order* Apiaceæ or Umbelliferæ. *Sexual system*, Pentandria Digynia. This plant is biennial or perennial, is a native of Europe, frequenting many of its water courses, rising to the height of from two to four feet. The fruit or seeds are from a line to a line and a half in length, ovate oblong, narrow above, somewhat compressed, marked with ten delicate ribs running the length of the seeds and covered with the remains of a calyx, and with the erect or reverted styles. What is generally regarded as *one* seed is in reality two, closely united at their sides, and of a yellowish brown color.

The *water hemlock* blooms like the Conium maculatum, in umbelliferous clusters, in June and July. The fresh leaves are said to be injurious, and cattle after having eaten them are seized with a sort of paralysis. By drying they are said to lose their deleterious properties; the odor of the recent seeds is exceedingly strong and disagreeable. Their taste is oily, acrid, and aromatic. The narcotic properties of the plant are said to vary according to the weather and climate, flourishing best in hot, dry seasons. The seeds should be gathered in the autumn, the leaves in the flowering season. The carefully dried seeds retain much of their strong and sickening odor. The decoction, however, has but little taste, and an extract resulting from its evaporation is nearly inert, from which circumstance it may be inferred that the active principle is volatile or decomposible at the boiling temperature. By a series of experiments the author satisfied himself of the presence in these seed of *albumen*, *gum*, *a fatty resin*, *volatile oil*, *an alkaloid* which he esteems to be *conia*, and in the ashes he detected *alumina*, *lime*, *iron and magnesia*. By distilling the ground seeds with water, a light yellow colored volatile oil is obtained, lighter than water, and possessing the aromatic odor of the plant.

When the ground seeds are digested in ether, they yield by its evaporation a dark brownish black extract, containing a fixed oil and a resin, and having the smell of the plant in a high degree, as it retains the volatile oil also.

The activity of the plant appears to reside in an alkaline principle which is analogous if not identical with conia, as when the seeds are rubbed with liquor potassæ, the peculiar mousey odor of conia is exhaled, and a rod moistened with hydrochloric acid, brought near, causes white vapors. The author subjected the ground seeds of water hemlock to distillation with caustic potassæ by Geiger's process, neutralized the distilled alkaline liquid with sulphuric acid, evaporated the liquid to a syrupy consistence, and added anhydrous alcohol so long as sulphate of ammonia was afforded, which was separated by filtration. The alcohol was now distilled off, and the residue mixed with a solution of caustic potassæ, and distilled anew. A yellowish oily matter passed over with the water and floated on its surface. During the process the peculiar odor of the plant was copiously evolved. The amount yielded by one pound of the seeds was somewhat less than a quarter of a drachm. It is very slightly soluble in water, but readily in alcohol and ether; and it reddens turmeric paper and neutralizes acids.

The medical properties of Phellandrium seeds are stated to be aperient, diuretic, emmenagogue, expectorant, sedative, and narcotic. In over doses it produces intoxication and other narcotic effects. It has been used with signal success in chronic pectoral affections, as asthma, bronchitis and pulmonary consumption. Dose from three to five grains in substance.*

ON CITRINE OINTMENT MADE WITH BEAR'S OIL.

By William Prior Creecy.

To the Editor of the American Journal of Pharmacy:

Dear Sir,—I send you with this letter a specimen of Citrine Ointment, in which the neatsfoot oil and lard is substituted by bear's oil. I am under the impression that it is much less liable to change, and is fully as economical as the formula now officinal in the U. S. Pharmacopœia. Bear's oil can be furnished in Philadelphia at a cost not exceeding two dollars a gallon, and can readily be obtained in this section of the country *pure*, which is a great desideratum. This is the recipe by which the specimen sent was made.

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*M. Hutet [Dorvault's Officine, page 452] states that he obtained a neutral liquid from Phellandrium by the process for Cicutin, which had a strong odor and was very active.—Ed. Am. Jour. Pharm.

Take of Mercury	an ounce.
Nitric acid,	fourteen fluid drachms.
Bear's oil,	thirteen fluid ounces.

Heat the oil in a porcelain capsule to 200° Fahr., and add the solution of nitrate of mercury gradually, stirring continuously till effervescence ceases, and frequently till cool, with a glass or porcelain spatula.

Hoping it may prove worthy of a space in your valued Journal, and be of use to pharmaceutists, I subscribe myself yours most truly, WILLIAM PRIOR CREECY.

Vicksburgh, Miss., April 10, 1860.

ON CARYPHA PUMOS, A SPECIES OF PALM.

By HERMAN FRITSCH.

[Extracted from an Inaugural Essay presented to the Philadelphia College of Pharmacy.]

[This essay, from which the following abstract has been made by the Editor, was worked out by Mr. Fritsch in the laboratory of Dr. Genth, of Philadelphia. It exhibits great care and skill in the author, but its details are too extended, and the subject itself of too little pharmaceutical importance to grant it the space it would require, if printed entire.]

The author begins his Essay by stating the importance of common salt as a necessary mineral element of animal food, and refers to the sources whence inferior races of mankind derive this important substance. He remarks, "An instance of this kind, which is also mentioned in several works by persons who have travelled in Surinam and Brazil, is that of various tribes of Indians inhabiting the interior of these countries who obtain their salt from several species of palm growing abundantly in their immediate vicinity.

By this interesting fact I was induced to investigate the subject by several careful analyses. The specimen which I examined bore the doubtful name of Carypha pumos, a name which I have exhausted all reliable works at my command to find. It was obtained from a tree, 40—60 feet high, growing in the sandy soil of Surinam. From this variety of palm the natives prepare their salt by burning the stems cut up in logs, boiling the resulting ashes in water, straining, and evaporating the solution in iron vessels. The moist mass which remains behind, and which is a very impure substance, containing, besides chloride of sodium, carbonate of soda, sulphate of potash, and a large portion of carbonate of potash, as will be seen from the analyses, is pressed in round masses several inches in diameter, afterwards wrapped in palm leaf and stored for use. The Indian when hunting always carries with him one or several of these balls suspended by a cord from his waist."

The author then describes his plan of getting the palm ashes, as follows:—"The dry palm wood, after being freed from all adherent impurities, was cut up in small pieces, which were burned at as low a temperature as possible in a shallow dish, by which process it was mostly carbonized. This mass was lixiviated with distilled water to remove the chlorides and the carbonates of the alkalies, as they prevent by their ready fusibility the complete combustion of the particles of carbon still diffused through the mass, and might at the same time partly be lost on account of the volatility of the chlorides. A current of carbonic acid was passed through the liquid to destroy the causticity of any free alkali. The filter containing the carbonized matter was dried and burned in a platinum crucible until all combustible matter disappeared. The crucible was then allowed to cool, and its contents washed into the solution, and the whole evaporated in a silver dish to perfect dryness." This dry mass was powdered and well mixed, and constituted the subject of the analysis, which resulted as follows:

1.801 grms. of ash	gave	0.3487	grms.	of Carbonic acid.
"	"	0.1683	"	of Silicic acid.
" for PO^5	"	0.0874	"	of Pyrophosphate of magnesia.
"	"	0.0822	"	of Proto sesquioxide of manganese.
"	"	0.0609	"	of Sesquioxide of iron.
" for MgO	"	0.3036	"	of Pyrophosphate of magnesia.
"	"	0.2111	"	of Carbonate of lime.
"	"	1.4280	"	of Chloroplatinate of potassium.
"	"	0.6141	"	of Chloride of sodium.
0.890 grms. of ash	gave			
"	"	0.0489	"	Sulphate of baryta.
"	"	0.5844	"	Chloride of silver.

From these results the composition of the ashes may be represented as follows :—

The soluble portion consists of			
Chloride of sodium . . .	26.74	per cent.	
Carbonate of soda . . .	6.79	"	
Sulphate of Potash . . .	4.09	"	
Carbonate of Potash . . .	19.23.	"	
			56.85.
The insoluble part of			
Silicic acid	9.34	"	
Proto-sesquioxide of manganese .	4.56	"	
Sesquioxide of iron . . .	3.38	"	
Carbonate of magnesia . .	13.33	"	
Pyrophosphate of lime . .	5.56	"	
Carbonate of lime . .	5.76	"	
			41.93.
	98.78.		

ON THE GREEN FRUIT OF DIOSPYROS VIRGINIANA, OR PERSIMMON.

By John E. Bryan.

(An Inaugural Essay.)

The persimmon is an indigenous tree attaining an average height of 40 feet in favorable situations in the southern and middle States. The trunk is covered with a rough, black and deeply furrowed bark, resembling some of the species of oak. The unripe fruit, which is officinal in the secondary list of the U. S. Pharmacopœia, is the portion which I have selected as a suitable subject for an experimental essay.

It consists of a round or oval berry of a pulpy nature, containing from one to ten well developed seeds of a hard and horny character, arranged in a star-like form. From among a great number of experiments I have selected the following as being most satisfactory.

1st. A quantity of persimmons were gathered about the first of August. At this time they were not more than two-thirds of their size when mature, of a deep green color, and purely astringent taste. An infusion was made and portions tested with solutions of gelatin, subacetate of lead, and acetate of strychnia. These all gave precipitates, the latter soluble in an excess of the precipitant; and on adding to the infusion a few drops of tincture of chloride of iron it gave a *deep olive green* color.

2d. An infusion was made the same as before, and refusing to filter, I heated it to the boiling point, expecting to find it precipitate; no such effect taking place, I continued the evaporation to dryness. Then, on powdering this extract, and treating it with washed ether, the ethereal liquid gave me by evaporation one-twentieth of the weight of the extract used, of nearly pure tannin, of a light green color, still striking the olive green color with a persalt of iron.

A portion of the residue was incinerated in a test tube and gave an ash entirely *neutral* to test paper.

3d. A portion of the fruit was gathered in the latter end of October. They were now of their full size, and beginning to turn from green to a yellow color, very juicy and sweet and astringent.

An infusion still gave precipitates with the former tests, and the same olive color with tincture of muriate of iron. It was much thicker and more mucilaginous than the former. It was evaporated to the consistence of an extract, which, I observed, absorbed moisture in damp situations and became soft and pliable like India rubber. A portion of these berries were sliced transversely and carefully dried. The segments were hard and brittle in dry weather, but in a damp atmosphere became quite soft and pliable. They lost by the process 112½ parts in 150, but still retained their astringency.

From the fact that the infusions refused to precipitate when boiled, the extracts being gummy and soft, and the dried fruit absorbing moisture, I inferred there was pectin present. Accordingly an infusion of the dried fruit was boiled with carbonate of potassa, and then muriatic acid added gave a gelatinous precipitate characteristic of pectic acid.

4th. 480 grains of the dried fruit were digested in alcohol, decanted and evaporated, which left a saccharine mass, having an astringent taste. This mass amounted to 180 grains, partially soluble in water, seemingly decomposed by a solution of caustic potassa, giving a deep brown color. It was soluble in strong sulphuric acid, giving the same dark color.

The residue from the tincture was treated with water, which removed but little, as the residue when dried weighed 210 grains, which consisted of the cellular tissue surrounded by an *insoluble matter*. This insoluble matter, which could not be separated from the ligneous fibre, was observed in the residue of all the infusions and tinctures.

The preparations were repeatedly tested for *starch* without effect. It has generally been supposed that to render persimmons sweet and edible, the action of frost is necessary; this is not the case, for a portion of the fruit gathered in October, which were hard and astringent, were enclosed in a box and put in a drawer. In a few days, wishing some for an experiment, I opened the box and was much surprised to find that they had become soft, sweet, and of a yellow color, without astringency, except the epidermis, which is always astringent even when ripened in the usual way.

We may conclude then:

1st. That the astringent principle in the persimmon is *tannin*, analogous to that of cinchona, catechu, &c.

2d. That the fruit contains pectin, which increases in quantity as it matures.

3d. That it contains no vegetable albumen, starch, or resin.

4th. That they retain their astringency when dried carefully; and

5th. That there is always an insoluble matter that increases in bulk as the fruit matures.

The persimmon then contains tannin, pectin, sugar, lignin, and coloring matter.

[Note.—In the concluding remarks the author states that he has not been able to determine the character of the insoluble matter which is present and increases as the fruit matures. He does not think the sugar is formed at the expense of the tannic acid, but is secreted from the sap of the tree, and he regards the opinion that the disappearance of the tannin at maturation results from its combination with the pectin in a way he does not attempt to explain.

The author evidently has not seen the paper of Benjamin R. Smith, published Oct., 1846, in vol. xviii. of this Journal, to which the reader is referred, as the two papers when considered together mutually throw light on each other. Mr. Smith arrived at the conclusion that the *insoluble* matter of Mr. Bryan was apothegm, or altered tannin, and attributed the

the increase of the apothegm to the decomposition of the tannin by the action of the air, yet at the same time he made the mistake to consider it as oak tannin, which is not thus alterable by atmospheric action. Mr. Smith considers that the tannin also contributes to the increase of the sugar, but in what way is not distinctly made out. He also showed that a part of the lignin disappears in the ripe fruit, and is found in the shape of sugar. He also found that persimmons, which by dropping from the tree rupture their epidermis, lose their astringency much more rapidly than those which remain whole on the tree, which he attributes to the direct action of the atmosphere on the juices.

Mr. Smith found malic acid in small quantity and also proved that the saccharine matter by exposure in a moist state yields malic acid by a sort of fermentation. But he was not able to find pectin, one of the substances detected by Mr. Bryan.—Ed. Am. Journ. Pharm.]

ON SYRUP OF LACTUCARIUM AND SOME OTHER SYRUPS.

By William Procter, Jr.

The attention of medical practitioners has of late been turned to the syrup of lactucarium, and the preparation usually sold by apothecaries in this city is that known as Aubergier's, a French preparation, made by dissolving 30 parts of alcoholic extract of lactucarium in 500 parts of boiling water, straining the liquor and adding it to 15,000 parts of boiling simple syrup, which is kept boiling, and albuminous water added from time to time till it is clarified. It is then skimmed, and 15 parts of citric acid dissolved in it; and when sufficiently reduced by evaporation 500 parts of orange-flower water are added and the whole strained.

This syrup is too dilute, containing but two grains of lactucarium to the fluid ounce, and besides is troublesome to make, and apt to be turbid.

By the following process a syrup can be obtained much more easily, of four times the strength, and quite transparent. It is an adaptation of Finley's process for syrups of oleoresinous substances to this drug.

Syrupus Lactucarii.

Take of Lactucarium,	half an ounce,
Carbonate of Magnesia,	two drachms,
Sugar, in coarse powder,	fourteen ounces,
Alcohol, Water, each,	a sufficient quantity.

Rub the lactucarium first with the carbonate of magnesia and an ounce of sugar until thoroughly reduced to powder, and then with a fluid ounce of alcohol; after which pour in water with constant stirring until half a pint has been added. The whole is now poured into a paper filter; and after the liquid has ceased to pass, pour on more water until a pint has been obtained. Evaporate this liquor to nine fluid ounces by a moderate heat (150° F.), add the remainder of the sugar, and by the aid of heat form a syrup which should, when finished, measure a pint.

Syrup of lactucarium thus prepared has the sensible properties of the drug in a marked degree, is perfectly transparent, with the color of officinal paregoric at first, but becomes rather darker. Each teaspoonful contains the soluble portion of nearly two grains of lactucarium, or 15 grains to the fluid ounce.

Syrupus Capsici.

Take of Cayenne Pepper, in fine powder,	two drachms,
Carbonate of Magnesia,	one drachm,
Sugar, in coarse powder,	fourteen ounces, troy,
Alcohol, Water, each,	a sufficient quantity.

Rub the Cayenne pepper first with the carbonate of magnesia and sugar, and then with a fluid ounce of alcohol, and slowly pour in the water until six fluid ounces have been added. The whole is then to be transferred to a proper filter; and when the liquor has ceased to pass, pour on water until nine fluid ounces of filtered liquor are obtained. To this add the remainder of the sugar, and by a gentle heat form a pint of syrup.

Made in this manner syrup of capsicum is a pungent yellowish brown syrup, each teaspoonful of which contains nearly two grains of Cayenne pepper.

Syrupus Balsami Peruviani.

Take of Balsam of Peru,	two drachms,
Carbonate of Magnesia,	two drachms,
Sugar, in powder,	fourteen ounces,
Alcohol, Water, each,	a sufficient quantity.

Proceed in the manner directed for syrup of capsicum, and make a pint of syrup.

I have tried this process with cubebs and its oleoresin, with assafœtida, and some other substances where the chief virtues reside in volatile oil and resin, without a satisfactory result, but there are many others to which it may be applied.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

Influence of Fatty Bodies on the Solubility of Arsenious Acid.—M. Blondlot, of Nancy, calls the attention of toxicologists to the fact that arsenious acid, in the presence of even small quantities of fatty oils, has its solubility in water, or even slightly acidulated or alkaline water, reduced to 1-15th or to 1-20th of what it is under other circumstances where the fatty matter is absent. The constant occurrence of fat in food and its presence in the stomach must more or less modify the rapidity of the action of arsenic, and accounts for some discrepancies in the record of poisoning by this agent.

The author deems it proper, in view of this property of the fixed oils, to recommend their use, and especially in the form of milk, as an antidote in the absence of the more certain agents, or whilst they are in preparation.—*Journ. de Pharm., March* 1860.

Synthesis of Salicylic Acid.—MM. Kolbe and Lautermann have succeeded in preparing salicylic acid $C^{14}H^{6}O^{6}$ by passing a stream of carbonic acid gas into hydrate of phenyl, whilst at the same time fragments of sodium are projected into it. Hydrogen is disengaged and salicylate of soda is formed. This is dissolved in water, chlorhydric acid added heated to boiling, when on cooling salicylic acid separates in crystals.—*Annalen der Chem. und Phar. in Joun. de Pharm.*

On the non-poisonous nature of Methyl-strychnia and Methyl-brucia.—M. Stahlschmidt (Ann. der Phys. und Chem.) has determined that when an equivalent of hydrogen in either strychnia or brucia is substituted by methyl ($C^{2}H^{3}$), these bases become innoccuous. The author by experiment found that a rabbit which took five grains of methyl-strychnia without any bad symptoms died in five minutes when one-twentieth of a grain of strychnia was put on its tongue. This modification of the poisonous properties of strychnia appears to be due to *methyl*, because, as the author remarks, the hydrocyanate of methyl is perfectly inoffensive.

Methyl-strychnia is prepared by placing strychnia in fine powder in contact with iodide of methyl forming a new combination which is an iodide of methyl-strychnia. Its formula is $C^{44}H^{24}O^{4}N^{2}I$. It is very soluble in hot water, but requires 212 parts at the ordinary temperature. The salts of silver decompose it, and by contact with oxide of silver the base is set free. It is obtained most easily by decomposing the sulphate with baryta water, filtering and crystallizing in long yellow crystals containing 16 or 17 per cent. of water. In this hydrated state it is very soluble in water and alcohol, but insoluble in ether. The translator, M. Nickles, queries whether the methyl bases derived from quinia, conia, and nicotine may not be thus altered in their toxical relations.—*Journn. de Pharm. et de Ch.*, *March*, 1860.

Urate of Quinia.—Dr. E. Perayre, of Bordeaux, has suggested this salt for use in medicine on the ground that many cases of intermittent fever have been cured by the ingestion by the patients of a certain portion of their own urine. Urate of quinia is prepared as follows: 10 parts of quinia and 20 parts of crystallized uric acid are employed. Into a suitable vessel 500 parts of distilled water is poured and heated to ebullition,the quinia added, and boiled ten minutes; the uric acid is then added in fractions, and the mixture agitated with a spatula, and the boiling continued an hour, adding water to preserve the measure; the liquid is then poured off and filtered and an equal measure of water poured on, boiled 20 minutes and filtered. Unite the liquors, and evaporate to dryness by a gentle heat. A yellow colored salt results, partly amorphous and partly crystallized in brilliant tables. Urate of quinia is soluble in boiling and hot water, but much less easily in cold water.

The author attributes to this salt the advantage of curing intermittents better than the sulphate, in a smaller dose, and has less tendency to produce the singing in the ears and cerebral excitement. It also is less bitter and is more easily tolerated by the stomach. The dose is half that of the sulphate—3 to 3½ grains in twenty-four hours.—*Journ. de Pharm. et de Ch., Fev.* 1858, *from Mon. des Sci. Med. et Ph.*

Veratria in Pneumonia.—Prof. Vogt, of Berne, gives as much as five milligrammes (1.13th of a grain) of this alkaloid every two or three hours till the production of vomiting and reduction of pulse. He administers the veratria in pills ordinarily, but were these nauseate very easily, gives it in solution. The quantity necessary to be given to produce the desired effect is from 25 to 30 milligrammes usually; but in certain cases, not very susceptible, as much as 50 to 60 milligrammes may be given in 24 hours. If the stomach is very irritable, the dose is reduced to 2½ milligrammes every 2 or 3 hours, given with a little opium, or in an effervescing powder. The effect on the pulse is more slowly produced, but is equally certain. *Répertoire de Pharmacie*, Feb. 1860. This use of veratria is equivalent to the extensive dosing with veratrum viride now so prevalent in the United States. Does not this show that it *is* veratria in this plant which acts as an arterial sedative?

On the part played by Quercitrin in the Coloring of Flowers, by M. Hlasiwetz.—Quercitrin has been found in the flowers of Reseda luteola, Capparis spinosa, and recently in those of the horse chestnut. It is a characteristic of quercitrin and its derivatives to yield various colors by decomposition under certain circumstances, and the author thinks that nature may effect these metamorphoses as well as the chemist. It is sufficient to add one sixty-fifth of a grain of *quercetic* acid to 21 pints of alkaline water to get a beautiful rose color. A solution of quercetrin is colored green by traces of iron salts; and an infinitesimal quantity of *quercetic* acid is sufficient to give a blue color to a weak solution of chloride of iron. With these reactions there is no difficulty in explaining the play of colors presented by the flower of the hyacinth, the tulip and the dahlia.

On Quinio, a crude quinine.—M. Batka (Chem. Central-bl.

1859) states that under the name of *quinio* a product of cinchona bark is known in Brazil, prepared from the fresh bark by aid of lime and alcohol. It is very rich in quinine, and yields the crystallized sulphate by boiling with dilute sulphuric acid. It is a yellow, resinous looking substance, insoluble in cold water, gives bitterness to hot water, and is very soluble in alcohol and ether. It is free from cellulose, and leaves only a small ash of carbonate of lime by incineration.—*Jour. de Pharm.*

Iodoacetic Acid.—MM. Perkin and Duppa (Annalen der Chem. und Pharm.) have succeeded in making this new acid by decomposing bromacetic ether by means of iodide of potassium in powder; the liquid becomes yellow and becomes sensibly heated. After some hours' repose in the dark, at the temperature of 104° to 122° F., the bromide of potassium is separated by a filter, and the liquid boiled with baryta water until the odor at first produced is dissipated. The excess of baryta is now eliminated by a current of carbonic acid gas, when the liquid is filtered and evaporated to get crystallized iodoacetate of baryta, from which the acid can be separated by means of sulphuric acid. Its formula is $C^4H^3IO^4$, and may be obtained in crystals by evaporation in vacuo over sulphuric acid. When boiled with oxide of silver it gives glycolic acid.

The alkaline iodoacetates are deliquescent. Iodoacetic ether is an oleaginous liquid, heavier than water, with an irritating odor. It is decomposed by light.—*Jour. de Pharmacie et de Ch., Fevr.* 1860.

Purification of Arseniferous Phosphoric Acid.—M. Werbrunn, (Arch. der Pharm.) says that arsenious acid, when present in phosphoric acid, may be removed by boiling its solution with hydrochloric acid, which converts the acid into chloride of arsenic, which is then volatilized with the excess of muriatic acid.

Preparation of Nitrate of Silver, by M. Greiner, Pharmacien of Schiltigheim, near Strasburgh.—Take any quantity of silver coin, dissolve it in nitric acid, precipitate the impure nitrate of silver thus obtained by a solution of sulphate of soda till it ceases to yield, wash the sulphate of silver, and then decompose it with a hot solution of nitrate of baryta. The sulphate of baryta is then removed by filtration through asbestos, and the clear solution of nitrate of silver evaporated and crystallized.—*Jour. de Chimie Med.*, *Janv.* 1860.

Root of Hibiscus esculentus, or Okra.—G. Della Sudda states (Répert. de Pharm., Janv. 1860) that this root is largely employed at Constantinople and other portions of the East, as a demulcent, in the same way as althæa root is used in Europe, and seems to possess much the same properties. This vegetable originated in the East Indies, then extended into other parts of the world, its fruit being, as is well known, much used as an article of diet for soups.

In the neighborhood of Constantinople and in the interior, its culture is conducted on a large scale, entire plains and vallies being covered with it, in fields requiring but little care or manure. The size attained by the fruit varies much, being from an inch to ten or twelve inches. The recent roots have a length of from 18 to 24 inches, with a diameter of half an inch to an inch and a half; yellowish white epidermis, removed easily by rubbing, and yields by pressure a thick mucilaginous juice in great abundance. In equal quantity compared with the althæa root, it yields double the quantity of mucilage, and free from the odor of the althæa. Its powder is beautifully white, and superior in all respects to that of the marshmallow.

Easy means of Silvering Copper and Brass Surfaces.—M. Boudier recommends a powder composed of 12 parts of cyanide of potassium, 6 parts of nitrate of silver, and thirty parts of prepared chalk. Rub the surface to be silvered with a moist rag which has been dipped in this powder, and a deposition of silver takes place which is strongly adherent, and may be used advantageously to apply to some utensils before bringing them in contact with acid fruits.—*Répert. de Pharm.*, *Janv.* 1860.

Adulteration of Rhubarb.—In France as well as in England the powder of Turkey rhubarb, it seems, is extensively adulterated with that of the home grown root. M. E. Billot gives a method of detecting this adulteration, which, if successful, is certainly very simple. Place a little of the suspected rhubarb in a glass, or on a plate, and drop on it two or three drops of some essential oil, either bergamot, aniseed, or fennel, then add a little magnesia, and rub them together for three or four minutes. If the rhubarb be pure Turkey or Russian, the powder remains of a yellowish color; but if it contain a mixture of French (Rheum rhaponticum) it assumes a tint which will vary from a salmon to the brightest rose-color, according as there is little or much of the adulterating ingredient. We can by this means, says M. Billot, discover the least trace of fraud, and the test can be used by anybody, as it requires neither study nor manipulatory skill.—*Chem. News, London, Feb.* 4, 1860, from *Science pour Tous.*

The Comparative Value of different Species of Aconite.—The various species of aconite, like the various species of cinchona, are known to contain different proportions of the active principle. The *aconitum paniculatum* is found to possess the least, and the *aconitum napellus*, which resembles in all points, in its botanical characters as well as its energetic properties, the *aconitum ferox* of the Himalaya, is found to yield the most aconitine.

The alcoholic extract furnished by an equal weight of fresh leaves of the two sorts differ notably. The *aconitum paniculatum* yields a third more product; but the extract of the aconitum napellus furnishes a considerable quantity of aconitine, while that of the paniculatum gives only a trace. The aqueous extract of the aconitum napellus is almost inert, the reason being that *tannate of aconitine*, which water alone will not dissolve, is formed in the marc during the preparation of the extract.—*Chem. News, London, Feb.* 4, 1860, from *Rep. de Pharm., Nov.,* 1859.

NOTES ON LACTUCARIUM AND ITS PREPARATIONS.

By Edward Parrish and William C. Bakes.

Sixty years have elapsed since the now venerable Dr. J. Redman Coxe, of Philadelphia, announced through the Transactions of the American Philosophical Society, the preparation of a concrete exudation from the mature lettuce plant, having narcotic properties and so nearly resembling the product obtained from the poppy as to be denominated Lettuce Opium.

Numerous essays have since appeared treating of this subject in its chemical relations; herb growers have experimented upon its production, and practitioners upon its use, with the result of placing it permanently among the list of officinal drugs, being, like many of that class, highly esteemed by some, pronounced unreliable by others, and wholly neglected by the large majority of physicians.

Among the causes of the popularity of particular remedies, their physical characteristics, facility of employment, and adaptation to the ordinary forms of preparation will be found to exercise an important influence, and perhaps the principal obstacle to the general adoption of lactucarium as a remedy may be found in its unusual toughness and resistance to mechanical division and to the action of ordinary solvents.

There is frequently a demand for a good substitute for opium not possessed of its astringency or of the peculiar properties which so often forbid its use, and lactucarium has been found by many to meet this demand; yet there are, no doubt, thousands of druggists who do not number it among their articles of stock, or if they keep it at all have perhaps a few drachms laid away among the rareties which invariably accumulate in some secluded corner of the shop.

There are few drugs produced so near home, about the varieties and sources of which so much confusion exists among well informed pharmaceutists. There are three well marked commercial articles under this name in our market.

First. The so-called English lactucarium, in small, irregular, brittle masses, from the size of a pea to that of a chestnut, of a dark brown color, heavy narcotic odor, a rather slow but decided bitter taste—a few pieces having a white efflorescence upon them.

Second. The so-called German lactucarium, occurring in larger pieces, varying from the size of a hickory nut to that of a walnut; these are convex on one surface, and generally sections of a sphere or of a cup-shaped mass of, perhaps, 3 inches diameter, the inside surfaces being concave from the shrinking occasioned by drying; the color of this variety is much lighter than the foregoing, the odor, though narcotic, not quite so heavy; it is not so friable as the English, and when fractured the pieces present within, soft white spots. We have known this variety in commerce for a number of years, but do not meet with any description of it in the books at hand; it is evident that although it comes from the continent of Europe, its shape is that resulting from the process said to be pursued in the neighborhood of Edinburgh for the collection and drying of the juice.

The *third* variety is called Thridace, or French lactucarium. This is evidently not collected from incisions in the living plant as the other varieties, but is an extract obtained by the evaporation of the expressed juice of the stalks gathered at the season of their maturity; it has a darker color than either of the other varieties, is deliquescent, and generally occurs in fragments of cakes, as though dried upon a flat surface. The botanical sources of these several kinds of lactucarium are as obscure as their commercial history; as far as we know there is no certainty which of them are derived from *Lactuca virosa*, which from *L. sativa*, and whether any of them are derived from the *L. altissima* as recommended by M. Aubergier of Clermont, or from other botanical sources.

The price of the English variety is maintained at about $1.25 per ounce, while the German article, which is largely imported, is sold at less than half that price, and the French, though very little in demand, is still lower. The general impression is in favor of the superiority of the English, and we are informed that this obtains even on the continent of Europe, while the French thridace is little used, except as a domestic expectorant remedy.

The experiments we have tried aim at determining proximately the relative value of the two kinds designated as German and English, at the same time that it has been a leading object to find out the best mode of preparation. Omitting any details which do not tend directly to elucidate one or other of these points we note the following results. English Lactucarium by thorough exhaustion with diluted alcohol furnished a bitter tincture, which on evaporation yielded 44 per cent. of extract of a reddish brown color, of intensely bitter taste, reminding of the drug; this was not wholly soluble either in water, diluted alcohol, or strong alcohol. German Lactucarium yielded by the same treatment 36 per cent. of extract of a somewhat lighter brown color, equally bitter with a heavier narcotic odor and with a consistence more distinctly resinous and even brittle.

By strong alcohol the German yielded very nearly 50 per cent. of extract still lighter in color, some portions separating during the process in nearly white granules destitute of bitterness, probably the so-called Lactucone rendered soluble by a portion of the menstruum having been added hot, and then precipitated on its cooling. Of the dregs left after the thorough exhaustion by alcohol, only 25 per cent. were soluble in benzine. Considerable importance attaches to the temperature at which these evaporations are conducted, the most soluble extracts resulting when the temperature does not rise above 160° F. The manipulation pursued in the extraction of specimens consisted in first reducing them to as fine a powder as practicable by trituration and then percolating with the menstruum as long as it continued to be charged with the color and taste. Very considerable amounts of the alcoholic menstruum were necessary, while by this process water seemed to exert but little solvent action on the German variety.

Acting on the suggestion of William Hodgson, Jr., (American Journal of Pharmacy, Vol. xxx. p. 116,) a purified Lactucarium was prepared by depriving the crude drug of its "Caoutchoucoid matter." Benzine was selected as the best and cheapest solvent for this inert and very objectionable constituent; the German variety by this means yielded 42 per cent. which was left on evaporation as a nearly white tenacious mass without odor or taste. The purified lactucarium obtained was just half the weight of the drug; it was found to yield to diluted alcohol 66 per cent.; to strong alcohol 40 per cent.; to boiling water, 25 per cent.; and to boiling water acidulated with citric acid, 30 per cent., of its weight. It was readily reduced to fine powder, and after complete drying was free from the odor of benzine. Almost the whole of the odorous principle is extracted by Benzine, and as this is stated to be a sulphuretted oil, and the distilled water of lettuce is reputed to possess sedative properties, the purified lactuarium thus obtained can hardly be said fully to represent the drug.

The principal preparation of lactucarium now employed is *Aubergier's syrup* made by triturating 45 grs. of the Extract of English Lactucarium with 15 grs. of citric acid,[*] and sufficient boiling water to constitute with the proper proportion of sugar, a pint of syrup; this is then flavored with distilled orange flower water, and directed as an adjuvant in expectorant and numerous other mixtures, or given alone in doses of a teaspoonful. To this very popular remedy there are two objections, it is too weak and not sufficiently uniform, though very agreeable and much prescribed by some of the most successful practitioners.

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[*] Some recipes for Aubergier's syrup omit the citric acid, which, however, exerts a very favorable influence on the solvent action of water and furnishes a clear syrup where the preparation would be turbid without it.

Having often had occasion to make this syrup in considerable quantities, we notice that there is always a portion of undissolved extract, even when we have taken the precaution to add the hot syrup to the mixed acid and extract, a precaution which favors its complete solution. A carefully performed experiment with hydro-alcoholic extract treated with the acid and boiling water, as directed by *Aubergier*, left just one-third the weight of the extract undissolved; this portion was intensely bitter, and yielded 40 per cent. of its weight to strong alcohol, the exhausted dregs remaining were somewhat crystalline, but insoluble and apparently inert.

Convinced by our experiments that diluted alcohol is the very best solvent for this drug, an opinion which accords with that of *Aubergier*, and that an extract whether made with this solvent or with stronger alcohol becomes partially insoluble by inspissation to the solid consistence and is hence unsuited to make the fluid preparations required, we have found the most economical and efficient treatment to be that which thoroughly exhausts the drug, whether English or German, by diluted alcohol and arrests the evaporation at such point as to make each fluid-ounce equal to a weighed officinal ounce of the drug. The fact of the comparative insolubility of the active principles in aqueous menstrua makes it necessary to add alcohol toward the close of this evaporation, or rather to separate the resinoid deposit (which in the German has a light brown color, but in the English is black,) and by trituration with strong alcohol to produce a complete solution before the quantity of resulting fluid extract is finally reached; the fluid extract as thus prepared is black and intensely bitter, with a heavy narcotic odor. Any other forms of preparation which may be prescribed can be conveniently made of this fluid extract.

A tincture may be made by mixing two parts of fluid extract with six parts of diluted alcohol; it will then approach the strength of laudanum and may be given in similar doses.

The syrup is designed to be a weak preparation adapted to use as an expectorant. We see no advantage in attempting to combine the objects of a powerful narcotic remedy with the form of syrup, a form best adapted to mild anodynes. The proportion of two grains to the ounce furnishes a stronger preparation than *Aubergier's syrup*, supposing that in the latter the whole strength of the remedy were extracted, and we think we have gained the appropriate strength in the preparation now offered.

Syrup of Lactucarium.

Fluid extract of English Lactucarium,	a fluid drachm.
Sugar	thirty ounces, (offic.)
Water	thirteen fluid ounces.
Distilled orange flower water	two fluid ounces.

Triturate the fluid extract with a portion of the sugar, then dissolve this and the remainder of the sugar in the water by the aid of heat, strain, and when nearly cold add the orange flower water. If the fluid extract of German Lactucarium is used, the proportion should be increased, probably about 25 per cent. although we have no evidence founded upon experiment as to the relative therapeutic value of the two commercial varieties.

We have not referred particularly to the process of M. Gustin, in which water acidulated with nitric acid is the menstruum, as we cannot conceive of this furnishing a fair representative of lactucarium, nor to the formula of our colleague T. S. Wiegand, in which the use of carbonate of potassa is directed; this is particularly adapted to English lactucarium and furnishes a strong preparation but not an elegant one, a characteristic which is fatal to its general adoption.

ON SOME SPECIMENS OF DUGONG OIL.

By W. T. Fewtrell.

A few years ago Dr. Hobbs, the health officer at Moreton Bay, introduced the oil obtained from the dugong as a substitute for cod-liver oil. This animal is one of the herbivorous cetacea, and is found on the northern coast of Australia, in the Red Sea, the Persian Gulf, and also in the Indian seas. *Dugong doujoung*, or *dugong*, is a Malay word, which signifies sea-cow. The Dutch in the Indian archipelago called it *zee-koe;* among the Spaniards it was known as the *pesce done*, or sea-woman; and French naturalists have given it the name of *halicore*, sea-girl or syren. The Red Sea variety has been named by Ruppel the *Halicore tabernaculus*, in consequence of historical researches having led him to the conclusion that it was with the skin of this animal that the Jews were ordered to veil the tabernacle. In the Indian seas it is sometimes found of large size, from 18 to 20 feet long; but in Australia it is seldom found longer than 12 or 14 feet. The following description of the animal is borrowed from the *Naturalists' Library* and other works. In its general form the dugong resembles the common whale. The skin is smooth and thick, bluish above and white beneath, with a few remote and scattered hairs; the mammæ are situated on the chest, under the fins. The head is small in proportion and of a peculiar form. The upper lip is very large, thick, and obliquely truncated, forming a short, thick, and nearly vertical kind of snout, something like the trunk of an elephant cut short across. The surface of the truncated portion is covered with soft papillæ, and furnished with a few bristles; the lips are covered with a horny substance which assists in tearing the sea-weeds for food. The lower lip is much smaller, and resembles a round or oblong chin. To assist the animals in browsing upon the submarine vegetables, the anterior portion of the jaw is bent downwards at an angle, in such a way as to bring the mouth into a nearly vertical position. The greatest peculiarity of the animal is that the ventricles of the heart are widely detached from each other, being connected at the base only. Another singular circumstance is that the *inside* of the cheeks are studded with strong projecting bristles. The pectoral fins, resembling swimming paws, have no nails, but are verrucose. The tail is broad, horizontal, and crescent-shaped.

"Its favorite haunts are the mouths of rivers and straits between proximate islands, where the depth of water is but trifling (three or four fathoms), and where, at the bottom, grows a luxuriant pasturage of submarine algæ and fuci. Here, in calm weather, may small troops be seen feeding below the surface, and every now and then rising to take breath. The position of the mouth, the muscular powers and mobility of the lips, garnished with wiry bristles, and the short incisor tusks of the upper jaw, enable these animals to seize and drag up the long fronds of sub-aquatic vegetables, which constitute their nournishment. The mutual affection of the male and female is very great, and the latter is devoted to her offspring. If a dugong be killed, the survivor of the pair, careless of danger, follows after the boat carrying the body, impelled by an overmastering passion, and thus often shares the fate of its partner; indeed, if one be taken the other is an easy prize."

It is taken byMalays and also by the aborigines of Moreton Bay for the sake of its flesh, which is said to be very delicate and palatable, and to resemble young beef. The natives of Australia also use the oil for burning. Mr. Archer, who was at Moreton Bay before the oil was used as a medicine, tells me that the natives waited until a shoal got into a shallow water, and then surrounded and drove them into large nets. The oil was obtained by skinning the fish and then boiling down the "speck." Not much was obtained, the annual produce being estimated at about 200 gallons. Mr. Archer adds that, when opened, the stomach of the animal was always found full of seaweeds and *live worms*.

Now that a large demand for the oil has sprung up, a fishery has been organised, and the dugong has been taken in great numbers, but still not sufficient to supply the amount of oil in requisition ; and the deficiency would appear to be made up from an altogether different source.

But small quantities of what is called dugong oil have arrived in England, and I have only had the opportunity of examining three specimens. One was kindly given to me by Dr. Letheby, who received it some years ago, before the oil was in repute. Another, also given to me by Dr. Letheby, was, I believe, received at the Comsumption Hospital a few mouths ago. The third was imported expressly for me by Messrs. Johnson and Archer, Australian merchants. The price paid in Australia for a bottle containing about a pound and a quarter was 12*s.* 6*d.* All these specimens are solid at the ordinary temperature of the air, but with the first (which is of a brown color) there is a small quantity of dark colored oil on the surface. The others are white and perfectly solid. Considering the supposed source of the oil, it would be imagined that the dugong oil would present the same appearances, have the same smell and behave in the same way with chemical tests as the oils obtained from other cetaceans. Such, however, is not the case with the specimens I have examined, except, and then but partially, with the first. Of the smell of the first it is impossible to speak, for it has become so rancid that the natural smell of the fresh oil must be entirely gone. The other two, when cold, have a faint odor of tallow, which is greatly heightened when the oil is made hot. Strong sulphuric acid dropt on the first produces a deep brown color—on the other two, only a pale yellow color. Chlorine gas passed through the first deepened the original brown color, but the other two were unaffected by it. Now, remembering the action of these reagents on the oil from other cetaceans, I am inclined to think that neither of these three samples is genuine. I speak with diffidence in the absence of a well authenticated specimen to use as a standard of comparison; but I believe that two out of three are entirely factitious (mixtures probably of a vegetable oil with some solid animal fat), and that the other is largely adulterated. I am confirmed in this opinion by the following statement made by Dr. Hobbs in the *Melbourne Argus*:—"During a given period, when there was being sold in Sydney 50 gallons weekly, and in Melbourne 100 gallons weekly, there was little more than 100 gallons got from the Bay."

Under these circumstances, I would recommend an importer to receive with caution any consignment of the so-called dugong oil. It does not seem to possess any decided advantage over cod-liver oil, and its principal recommendation in Australia is that it is a colonial production. The very high price will prevent the export of much to England; and in a few years the supply will most likely cease. Several years ago a Frenchman wrote: "Tout annonce que dans quelques années le dugong aura entièrement disparu de dessus le globe;" and it is likely that the prophecy will be speedily accomplished as far as Australia is concerned.—*Chem. News, London, Jan.* 28, 1860.

NICKEL.

M. Charles Tissier has communicated to the Paris Academy of Sciences a note upon some peculiar properties of nickel. This metal, which is placed near to iron in the electro-chemical tables of Berzelius, as also in the classification of metals in families by Ampère, is again brought near to the latter metal in M. Thénard's classification according to the affinity of metals for oxygen. However, although nickel resembles iron so closely by its atomic weight and by analogous compounds, such as its salts, such is not the case when we consider nickel in other respects; thus it is generally supposed, on account of its place in the electro-chemical series, that nickel will precipitate copper from its solution as zinc and iron do. M. Tissier assures us, however, that no such phenomenon takes place. He has left pure fused nickel for 15 hours in a liquid containing a mixture of chloride of ammonium and sulphate of copper (1 part) and water (10 parts). At the end of this time no copper had been precipitated, and the piece of nickel which weighed 18·925 grammes before the experiment, weighed exactly the same when it was terminated. A piece of bronze of aluminium placed in the same conditions has been found to lose 6 per cent. of its weight, and a piece of German silver more than 7 per cent.

All acids, save nitric acid, have only a weak solvent power on melted nickel. In 15 hours sulphuric acid, diluted with twice its weight of water, only dissolved 0.032 grammes of 18 grammes submitted to its action. Strong hydrochloric acid only dissolved 0·15 grammes of the same quantity in the same time.

When these results are compared to those obtained with iron, zinc, copper, lead and tin, it is seen how superior nickel is to these metals, and how much nearer it comes to silver; for like the latter it appears to be attacked with ease by nitric acid alone. According to M. Wertheim the tenacity of nickel is to that of iron as 90 is to 70. M. Tissier next informs us that nickel can be obtained in France, in the pure state, at 10 francs a pound (Eng.), or 20 francs the kilogramme, and that, at this price, with the properties it possesses, it is capable of many useful applications, among others that of serving in calico printing to take off the excess of color or mordant from the cylinders. The bars at present used for this are of steel, which is soon attacked and destroyed by the sulphate of copper and other mineral substances employed as mordants of colors.—*Chem. News, London, Jan.* 21, 1860, *from Comptes Rendus, Jan.* 9, 1860.

NEW REAGENT FOR ALKALOIDS.

M. Schulze has observed that if perchloride of antimony be added drop by drop to a solution of phosphoric acid, a liquid is obtained which produces with ammoniacal salts, and with most of the alkaloids, precipitates similar to those which are formed by the phospho-molybdic acid of Sonnenschein; the following are the effects observed:—

Strychnine.—Solution of the nitrate at $\frac{1}{1000}$th abundant yellow caseous precipitate; at $\frac{1}{5000}$th white floculent precipitate; at $\frac{1}{25000}$th slight turbidity.

Brucine.—Solution of the hydrochlorate at $\frac{1}{1000}$th a rose-colored precipitate, soluble whilst warm, reprecipitated by cooling, leaving the supernatant liquid of a carmine red; at $\frac{1}{10000}$th the sesquichloride is still troubled, and the liquid takes a rose tint.

Quinine.—At $\frac{1}{1000}$th flocculent precipitate of a clearer color than that of strychnine; at $\frac{1}{5000}$th the liquid becomes opalescent.

Cinchonine.—At $\frac{1}{1000}$th blue flocculent precipitate; at $\frac{1}{5000}$th slight turbidity.

Veratrine.—At $\frac{1}{1000}$th dirty white flocculent precipitate; at $\frac{1}{5000}$th the liquid becomes opalescent.

Narcotine.—At $\frac{1}{1000}$th copious yellow flocculent precipitate; at $\frac{1}{4000}$th turbidity; at $\frac{1}{25000}$th a turbidity in the liquid is still perceived.

Morphine.—At $\frac{1}{1000}$th the liquid is too dilute to produce a precipitate.

Codeine.—At $\frac{1}{1000}$th the turbid liquid takes a dirty brown color.

Nicotine.—At $\frac{1}{250}$th slight turbidity in the liquid.

Coniine.—At $\frac{1}{250}$th liquid becomes slightly opalescent.

Piperine.—Yellow coloration even in diluted liquids.

Atropine.—At $\frac{1}{1000}$th caseous white precipitate, soluble in the warm liquid, completely thrown down again by cooling; at $\frac{1}{5000}$th slight turbidity, which becomes more sensible by long boiling.

Digitaline.—At $\frac{1}{1000}$th slight turbidity, which at first disappears by boiling, and then gives place to a voluminous precipitate.

Aconitine.—At $\frac{1}{1000}$th copious white precipitate; at $\frac{1}{5000}$th turbidity; at $\frac{1}{25000}$th liquid becomes opalescent.

Caffeine.—At $\frac{1}{1000}$th no reaction.

Theobromine.—At $\frac{1}{1000}$th slight muddiness.—*Chem. News, London, Jan.* 21, 1860, *from Journ. de Pharmacologie de Bruxelles, Dec.* 1859.

NEW APPLICATION OF COLLODION IN THE ARTS, BY PATENT.

Collodion and castor oil have received a new application. Messrs. Barnwell and Rollason use the mixture for making silks and other woven fabrics waterproof. Their manner of proceeding is as follows:—"Assuming the material under operation to be silk, we take collodion and mix it with vegetable oil, such as either hempseed, rape, olive, almond, nut, poppy, castor, cotton, or linseed oil, in the purest possible state, and we find that such oils when mixed with collodion undergo a change upon being subjected to heat, and this change or decomposition is highly advantageous in the subsequent processes to which the silk will be applied. The mixture of collodion and oil is spread or poured upon plates or cylinders of metal or glass, and before it is quite set the silk is laid or rolled over it and immediately removed, bringing away with it a thin film of collodion and oil. The silk thus coated is now removed to a stove or drying oven and submitted to a heat of 100° to 300° Fahrenheit, by which the mixture undergoes the before named change or decomposition, and the result is that a slightly glazed appearance is imparted to the silk, which is at the same time considerably strengthened or thickened, and may be rendered almost or quite opaque by the mixture of coloring or thickening matter with the collodion and oil. A thin silk is thus rendered equal in strength to a more costly one, and the quality of imperviousness to water, which the material possesses in a high degree, will be of service."

The patentees prepare their collodion with gun cotton or with xyloidine made from hemp, flax, jute, straw, sawdust, or starch, which they dissolve in any of the solvents of gun cotton and mix with any of the oils before mentioned, adding only so much of the oil or mixed oils as will be freely taken up by the solution. If they desire the coated silk or other fabric to be soft and pliable in its nature, they add a small quantity of animal oil to the solution. The proportions the patentees use for coating silk are 30 parts of the xyloidine dissolved in *about* 300 parts by weight of ether, with 100 parts of spirits of wine, with which is mixed from 75 to 100 parts of vegetable oils. This solution is allowed to evaporate in a still until it arrives at such a density that it will only just flow evenly over a glass plate, so as finally to leave a substantial film behind it.

If the patentee can make some light and inexpensive fabric waterproof, and at the same time soft and pliable, it would be extensively used by surgeons. Oiled silk is expensive, and the oiled calico and gutta percha tissue, sometimes used in its stead, lack the softness and pliability desired. The article we have suggested is greatly desired in our large hospitals.—*Chem. News, London, Jan.* 21, 1860.

POISONING BY TINCTURE OF ACONITE.

Dr. Heighway reported the case of a lady, an inmate of his family, who had taken a tablespoonful of the tincture of aconite root, in mistake for the compound tincture of cinchona. At the time of the committing of the mistake he was not at home. On his arrival, he found the patient almost pulseless. Every object looked green to her, and she complained of an intense heaviness about the stomach.

The first symptoms, he learned, were twitching of the muscles about the eye and nose, which continued until they became very distressing. There were also tingling sensations of the upper and lower limbs.

As he had no doubt, when he first saw the case, that absorption of the drug had taken place, he did not administer any emetic, but ordered brandy to be used freely, and directed a drachm of aromatic spirits of ammonia, with six or eight drops of tincture of camphor to be given every fifteen minutes. In a short time the pulse somewhat improved.

By the advice of Prof. Foote, of whom he inquired for an antidote for aconite, he prepared the following mixture: one pound of green coffee, boiled in a quart of water to a pint, then add a pint of alcohol and an ounce of gum camphor. Of this ten or twelve drops were given every ten minutes. After taking several doses of this she became somewhat relieved; the twitching and tingling mentioned, however, continued for some time.

At three or four o'clock in the morning of the next day she went to sleep, and at seven all symptoms of poisoning had disappeared.—*Druggist, Dec.*, 1859, *from Cin. Lancet & Observer.*

ANALYSIS OF CRAB ORCHARD SALTS.

These salts constitute the residue when the waters of the Crab Orchard Springs are evaporated to dryness, and have gained, in the last few years, quite a reputation in the West as a medicine. They are, consequently, made on an extensive scale by various parties residing in the neighborhood of the source of the water.

Little, however, seems to be known of the efficacy as a medicine, or even of their existence, in the Atlantic States, judging from the unanswered inquiries which have appeared in some of the periodicals devoted to the spread of pharmaceutical knowledge.

Being near the spot, and having daily occasion to handle this late and popular saline aperient, enables us to speak advisedly of it, in reference to its source, mode of preparation, and the use it is put to.

Crab Orchard Springs are situated around the town of Crab Orchard, in Lincoln county, Kentucky, are quite numerous, and yield several varieties of mineral waters, the principal and most useful of which are the saline springs, yielding the salts.

These waters have been closely examined by Dr. Robt. Peter, the Chemist of the corps of Geological Surveyors of this State, whose analysis we give below:

“Sowder's Springs yields two hundred gallons of water a day. Specific gravity, 1.006.

One thousand grains of the water, evaporated to dryness at 212°, left 7.153 grains of saline matter, which was composed of the following salts:

	GRAINS.	
Carbonate of Lime	0.506	held in solution by carbonic acid
“ Magnesia	.375	
“ Iron	a trace	
Sulphate of Magnesia	2.989	
“ Lime	1.566	
“ Potassa	.298	
“ Soda	.398	
Chloride Sodium	1.000	
Silica	.021	
Bromine	a trace	
	7.153	

The amount of free carbonic acid was not estimated.

CRAB ORCHARD SALTS.

The salts left by the evaporation of the water of this spring, constitute a moist, granular powder, with a slight brownish tinge, scarcely distinguishable from Havana sugar in appearance. Per centage comparative as follows:

℞ Sulphate of Magnesia,	63.19
Sulphate of Soda,	4.20
Sulphate of Potassa,	1.80
Sulphate of Lime,	2.54
Chloride of Sodium,	4.77
Carbonates of Lime, Magnesia, Iron and Silica,	.89
Bromine,	a trace,
Water of Crystallization a loss,	22.61
Total,	110.00

This salt was obtained by boiling down the water in an iron kettle to a certain density, and then, after allowing it to stand for some time in a wooden vessel, the clear liquid drawn off from the mixed deposit of carbonates lime, magnesia and oxide of iron, thrown down by boiling, was evaporated to full dryness.

Much of the Crab Orchard salt sold in Louisville has the appearance of New Orleans brown sugar, frequently mistaken for that substance by children, contains a considerable quantity of oxide of iron, and leaves a sediment of earthy carbonates, when dissolved in water, proving that it has not undergone the process of purification mentioned above. By some of the manufacturers much attention is paid to this process of purification of the salt, so that it is entirely freed from oxide of iron and the precipitated carbonates, and is perfectly white; but whether the removal of these ingredients of the water is not injurious to the full medicinal virtue of the saline matter may well be questioned. We should much prefer to let the iron remain in the salt.

Although the sulphate of magnesia is the principal ingredient of this saline mixture, the presence of the other saline matters, and of the carbonate of iron, modifies greatly the action of that well-known salt, so that the medicinal effects, from the use of the waters or their salts, are considerably different from that of a pure solution of sulphate of magnesia, and they are applicable to a greater variety of cases.

The medicinal virtues of these salts have been so highly appreciated of late, that many thousand pounds of them are annually prepared, and the demand in western drug stores and doctor's shops is greater for them than for the classic salts of Epsom. Physicians find these salts much less drastic, and more tonic, than pure unmixed Epsom salts, and more likely to act on the liver in the manner of calomel, when taken in small doses. They are especially efficacious in the treatment of headaches and other affections resulting from gastric disturbances. Several terrible cases of periodical headaches, with sick stomach and general derangement of the economy, which had resisted, for years, every other mode of treatment, were entirely and permanently cured by the use of these salts.

They are usually administered in one or three teaspoonful doses, thoroughly dissolved in a tumbler of water, and taken before breakfast. A very agreeable manner of taking this medicine, is to dissolve a dose in the smallest possible quantity of water, and fill up the tumbler from the jet of a soda fountain, and drink it while effervescing; or have your apothecary to prepare it in the form of bottled mineral water, each bottle containing a dose.—*Louisville Monthly Medical News*, *Feb.*, 1860.

THE SOAP-BARK OF SOUTH AMERICA.

By Professor S. Bleekrode, Delft, Holland.

Several months ago, a peculiar bark (*Quillaia saponaria*) was introduced into the European trade, and recommended to be employed instead of soap, for washing and cleaning printed goods, woollens and silks, and especially for the delicate colors of ladies' dresses, &c.

The soap-bark is externally black colored, but internally the liber consists of concentric layers of yellowish white. The bark is remarkable for its density, as it sinks in water. The cause of this is the great quantity of mineral substances which it contains; thus the internal layer yielded 13·935 per cent. of ash, dried at a low temperature, and 18·50 per cent. when dried at 100° C. The ash consists almost entirely of carbonate of lime, which forms 12·60 per cent. of the 13·935, and appears as small crystalline needles, isolated or in groups, in the cells of the liber, not only between its concentric rings, but in every part of it. These glitter in the sun, resembling, under the microscope, the arragonite form of the crystallized carbonate of lime.

Relative to the great amount of lime, it may be remarked that this mineral is generally characteristic of plants, in which mucilaginous or pectinic substances are found abundantly: thus the grains of the quince (*cydonia*) contain 10 per cent. of carbonate of lime, and are remarkable for their large quantity of jelly.

When the internal white layers of the bark are soaked and macerated in water, at the ordinary temperature, a clear solution, without any alkaline or acid reaction, is soon formed; this becomes slightly turbid by the action of the air. When shaken, a heavy scum is produced. The bark loses nearly 20 or 25 per cent. in the water. I have prepared an extract from four drachms in nearly one pint of water, and one part of this was sufficient to make, with sixty-eight times its weight of olive oil, a perfect cream-like emulsion, which does not become separated, even after several months. By mixing equal volumes of the bark extract and of oil, the same emulsion is formed without change of volume, but in a short time the oil is changed into a thick, pure, white, cream-like substance, swimming upon the clear water. There is, however, no separation of the constituents of the oil, as is the case by the reaction of alkaline substances. Alcohol does separate the emulsion, the oil is restored, and a white granular substance subsides.

The extract mentioned, has the property of reducing gold from its chloride; the glass employed for the experiment will be beautifully gilded; the reduction is much accelerated by the influence of the direct rays of the sun. The same power of reduction is shown, by mixing the extract with the alkaline copper solution as prepared by Fahling for the quantitative sugar-proof; the reduction into the red oxide of copper immediately follows on the application of heat. That this reduction is not produced by the presence of a sugar-like substance or glucose, is demonstrated by the experiment of Boettger with the basic nitrate of bismuth, for when this is boiled with the extract of the bark it remains white, which does not happen when there is glucose present in the smallest quantity. The solution of mineral chameleon is immediately changed from green to light yellow.

I have observed that the mucilaginous extracts made with water at a low temperature, by macerating the roots of the marshmallow (*Althœa officinalis,*) of the comfrey (*symphytum,*) and of the grains of the quince, have not the same influence on chloride of gold. The extracts of these roots precipitate the gold, under the form of the purple of Cassius, only at a boiling temperature; the mucilage of the grains of quince, however, likewise at ordinary temperatures, produces a precipitate having the lustre of metallic gold. The reduction of the copper, as mentioned above, will not happen. These mucilages have likewise the property of forming emulsions, but weaker and not so lasting.

The extract of the soap-bark is colored a reddish brown by nitrate of silver, and ammonia forms a precipitate. When a proper proportion of nitrate of silver with ammonia is prepared, a silver lustre, like that of the silvering of glass, will be produced by heat.

Concentrated sulphuric and nitric acids produce, by boiling, a sediment in the form of white flocks; the white flocks produced by the reaction of sulphuric acid are colored brown by iodine.

The experiments with other chemical re-agents have not produced any characteristic result. The extract is not coagulated by boiling, nor precipitated by alcohol and ether. The cold prepared extract can be employed for washing, and deserves the name of "Vegetable Soap."

Indeed, long before the invention of our alkaline soaps, and even up to the present day, several roots and fruits were known by their capability of being employed as soap, and botanists have distinguished them by the name of *Saponaria* in their systems of classification. Pliny gave a description of the *Struthion*—our Shrubby Gypsophila (*Gypsophila Struthium, L.*) "It is astonishing," he says, "how woolens are bleached, and made supple by it—*Radicula lavandis lanis succum habet mirum quantum conferens candori mollitieique.*"—*L.* 19; *c.* 18.) Dioscorides mentions that the soap-wort (*Lychnis*, our *Saponaria*) is everywhere sold in the shops for scouring and cleaning dresses. Several of the family of the carophyllaceous plants (*Dianthus*, *Lychnis*, *Gypsophila*, *Silene*) are remarkable for this property in a greater or less degree. By recent chemical means there has been extracted from these roots a special substance, called *Saponine* or *Struthiine*, and to this, notwithstanding the very small quantity contained in the roots, the singular power is attributed of making emulsions, and of being used for soap, in washing. The soap-wort of the Levant (*Gypsophila*) is, to this day, employed in the East for washing and cleaning silks and shawls. It was generally used in the Mediterranean districts of France and Spain; the French called it *herbe aux foulons* (the fullers' plant.) The *Saponaire* or *Savonière* of the French, is the root of a kind of *Lychnis*.

The vegetable soap-principle, saponine, was found by Henry and Bourtron Charland, in the bark of the *Quillaia saponaria*. *Le Quillay* is a tree of the family of Rosaceous plants, a native of Huanuco, in Peru. Ferdinand Lebeuf made special mention of this bark in 1859 (*Comptes Rendus de l'Académie des Sciences à Paris*, xxxi., p. 652) for its richness in saponine, and recommended it for pharmaceutical use in preparing emulsions of oils, resins, balsams, and several other insoluble medicaments. He mentions likewise the bark of the *Yallhoy* (*Monnina polystachia.*)

From one bark, boiled with alcohol of 40° B. (or 0.828 sp.

gr.,) according to the method followed by Lebeuf, Rochleder, and Schwarz, the saponine was extracted. This substance is characterized by its lasting irritating smell, and by producing sneezing: in some cases a special aromatic flavor is perceived. It is remarkable how small a particle, a mere homœpathic dose, is sufficient to change a large quantity of oil into an emulsion. The saponine has likewise the power of reducing gold from its chloride.

The extract of the soap-bark, prepared as mentioned above, undergoes a spontaneous change, when exposed to the influence of the atmosphere for several weeks. The clear solution is then transformed into a colorless, thick, but transparent jelly, with a slight acid reaction. Its property of making emulsions is not the least diminished, but it has lost the power of reducing gold and copper as before, and the reaction on the mineral chameleon proceeds very slowly. In short to explain the change, it is sufficient to say, that by absorption of oxygen from the air, the substance extracted by water has been oxidised.

To conclude, it appears that the soap-bark retains two substances, saponine, and pectine, both soluble in cold water, and equally endowed with the faculty of making emulsions with oils and fatty substances. The large quantity of isolated pectine in the soap-bark is explained by the separation from the lime during vegetation. The spontaneous oxidation has transformed the pectine into the gelatinous acids, the pectosic acid and pectinic acid.

Several years ago, in 1832, M. Braconnot, in his inquiries as to the transformations of several vegetable substances into a new principle by the influence of concentrated nitric acid, remarked that he found the saponine in the bark of the *Chicot de Canada*, or *Gymnocladus Canadensis*, Lam. He says that it is possible to substitute this bark (and also its leaves) for the soapwort of the Levant. This tree is 30 or 40 feet high, able to stand our winters, and easily cultivated. I have also another sample of a bark containing saponine and pectine, which, when combined, are excellent for washing purposes.

Besides this, a kind of soap-bark is mentioned in the proceedings of the Boston Society of Natural History for 1855 (see also the *Edinburgh New Philosophical Journal*, vol. li., p. 201,) obtained from a tree called *Chelaria saponaria*. As there is no plant known by the name of *Chelaria saponaria*, I suppose that it is wrongly printed for the *Quillaia*, treated of in this paper. The soap-plants used for washing in California, and preferred by those who know their merits to the best kinds of soap, are the bulbs of *Phalangium pomaridianum*. In the above communication it is stated:—"All these contain considerable quantities of oleaginous and alkaline principles in their composition, on which their value depends." This opinion is altogether erroneous. None of the vegetables known as vegetable soaps contain oils and alkali; their property is entirely derived from neutral substances as above described.

In Guiana, the bark and fruits of the soap-wood tree (*Sapindus saponaria*,) called by the natives *Hurawassa*, is employed in the place of soap, and it is said that the fruit will clean sixteen times more goods than the same weight of common soap. A kind of *sapindus* called *Rarak*, is used in the same manner, at the Moluccas, and at Java.

The study of vegetable substances for their application as neutral soaps, merits the attention of modern dyers and printers, and certainly they can be recommended for delicate colors which are liable to be injured by the alkaline soaps.—*London Pharm. Journ. March*, 1860, *from The Journal of the Society of Arts.*

THE PREPARATION OF AN AERATED CHALYBEATE WATER.

By M. Sarzeau.

When clean pieces of iron are placed in a solution of carbonic acid prepared at 50° Fahr., and under normal pressure, small bubbles of gas are seen to form, which increase in size and are slowly disengaged. If platinum is rolled round the pieces of iron, the phenomenon is more apparent, and the experiment quicker made. By leaving the iron in the liquid until no more bubbles are seen to form, we obtain a liquor with a marked inky flavor, and which has all the properties of a solution of a protosalt of iron. If the liquor be heated it is at first turbid, then becomes milky, afterwards ochry, and at last, when it boils, it suddenly changes to a deep brown. On cooling it deposits a substance of the same color, which, separated by filtration, dried in the air, and dissolved in hydrochloric acid gives a mixture of the protochloride and perchloride of iron. If a magnet be brought in contact with the brown matter when dry, it is found to adhere, showing that by heating a solution of carbonate of iron magnetic oxide is formed.

The preparation of an aerated chalybeate water is very simple. We have only to place some clean pieces of iron in the upper vessel of one of the ordinary gazogenes, and set the apparatus in a cool place for 48 hours, by which time a liquid is obtained which only differs from the before-mentioned in the excess of carbonic acid which it contains. The taste is sensibly inky, but it is not at all disagreeable to drink.

Two experiments have been made to determine the amount of carbonate of iron in solution. In both cases a quantity of peroxide was found corresponding to rather more than half a grain of the protocarbonate in 100 grammes (3 oz. 1½ drs. 13 grs.) of the water. The quantity of iron in the water may be increased or diminished by leaving the two in contact for longer or shorter periods.—*Jour. de Pharm., Jan.*, 1860, *and Chem. News, Feb. 25th*, 1860.

ON TANNATE OF BISMUTH.

By M. Cap.

Tannate of bismuth has been introduced in France as a remedy for obstinate diarrhœa. It is prepared by first precipitating the oxide of bismuth from a solution of 44 parts of the crystallized nitrate by means of an excess of strong caustic soda. The precipitate is collected on a cloth and carefully washed. It is then triturated in a mortar with 29 parts of pure tannin. The magma is then diluted with water, the whole is thrown on a cloth, washed and then dried either in the open air or in a slightly heated closet.

The salt has a yellowish appearance; it is insoluble and consequently almost tasteless; it is easily suspended in a mucilaginous vehicle, in syrup, or in glycerine; and can also be administered in the form of pills, or of an electuary.

Its composition when thoroughly dry represents:

Oxide of bismuth	53
Tannin	47
	100

The above mode of preparation is very simple and at the same time the most rational. Most of the insoluble tannates are obtained by double decomposition; but the salts of bismuth and especially the nitrate, are in great part decomposed by water, and to keep them in solution it is necessary to have a great excess of acid, which, in the present case, would prevent the precipitation of the tannate of bismuth. It is better then to effect the combination directly, by acting on one equivalent of oxide of bismuth with one equivalent of tannic acid. The tannic acid may be dissolved in alcohol, ether, or even water, and then the tannin obtained in a resiniform mass can be used, which is cheaper than that obtained in the usual form.

The tannate is administered in doses of 30 grains.—*Rep. de Ph. and Chem. News, Feb.* 25, 1860.

CRYSTALLIZED GUAIACUM RESIN.

Prof. Hlasiwetz has, after a long trial, found a way to change the greater part of guaiacum resin into crystals. He dissolves a pound of the resin in as much alcohol as will make a solution of the consistence of a thin syrup. This he strains through fine linen, and adds gradually, while still warm, half a pound of caustic potash in spirit, shaking them together. The whole is allowed to stand in a bottle about 24 hours. The magma obtained is then transferred to a strong linen cloth, and the fluid part carefully pressed out. The moist cake is washed with strong alcohol until the alcohol runs away but slightly colored. The mass is again pressed, then triturated with a small quantity of water, and afterwards heated in a dish until reduced to a uniform consistence. It is then transferred to a filter and washed with cold water until the salt is white, and the water runs away colorless. This potash salt (which is but slightly soluble in alcohol and water) may be obtained crystalline by dissolving it in a large quantity of dilute alcohol at the boiling point. From such a solution, as it cools, crystalline flakes separate. By cooling it very slowly, larger crystals may be procured, which when dried have a pearly lustre. A second crystallization gives them a dazzling whiteness. From a solution of this salt in hot potash water, hydrochloric acid separates the resin. Immediately after the decomposition, the resin is fawn colored, soft, and sticky; it is washed with water, dissolved in alcohol, and the solution is allowed to evaporate spontaneously. By degrees it crystallizes completely. The crystals appear scaly, or are aggregated together, have a pearly lustre, and a slight but most agreeable smell like vanilla.

They dissolve in ether, warm acetic acid, and dilute potash ley, but are insoluble even in warm ammonia water. Sulphuric acid dissolves them, acquiring a purple color. Chloride of acetyl gives a substitution product, which may be obtained from an alcoholic solution in granular crystals.

It should be remarked that with this ingredient the blue reaction of tincture of guaiacum with oxidisable substances is not obtained.

From a mixture of the solution of the crystallised resin with a spirituous solution of soda, a soda salt is precipitated, which may be purified like the potash salt.—*Annal. der Chem. und Ph., and Chem. News, Feb.* 25, 1860.

ON PILULÆ.

By Mr. B. S. Proctor.

In my communication upon some of the Pharmacopœia preparations, printed in the *Pharmaceutical Journal* for July last, I suggested one or two alterations in our pilulæ.

Though you have since then had several contributions on the same subject from other sources, there is much yet to be done. I therefore now offer another mite towards its accomplishment. Some of my present suggestions are in direct opposition to some of those recently made, and my object in bringing them forward is not to supersede the recommendations of others, but to notice one or two considerations which appear to have escaped their notice, and to show the necessity of attending to the wants of all classes rather than to be guided by the experience of one individual, or class of individuals.

The physician prescribes, or the College requires, certain active medicines to be made into a pill mass.

The problem of the Pharmaceutist is to give to the mass plasticity, freedom from liability to change, and ready solubility in the stomach, and to accomplish these with as little outlay of money and labor as may be.

The difficulty or impossibility of attaining perfection in these requisite qualities, makes it desirable that we should avoid the liability to change, and obtain the ready solubility in the stomach, by preparing only small quantities of the masses as they are wanted, and economy of time demands that the labor of going through the whole process of weighing, powdering, mixing, and beating be not required of us every time a little Pilula Galbani Composita is wanted. The means by which this is to be attained is evidently to have the ingredients mixed in powder, requiring only the addition of a definite quantity of water or other excipient to convert them into a mass of the requisite qualities.

That this change would be acceptable to many is shown by the frequent demand for Pulvis Pilulæ Colocynthidis Compositæ, Pulvis Pilulæ Rhei Compositæ, &c. Mr. Muskett objects to such preparations as powder of Plummer's pill, on the ground that mixed powders have a tendency to separate on standing ; but such an objection, though in this case theoretically, or even practically true, will not apply to the Pharmacopœia pills as a class, any more than it will to Pulvis Jalapæ Compositus, Pulvis Confectionis Aromaticæ, &c., which preparations have never been considered objectionable in this respect.

It has been recommended to liquify the various ingredients with the aid of heat, water, &c., by which means a very perfect mixture is obtained, and the mass will better stand the scrutiny of a microscopic examination, *but this is a theoretical advantage not of practical importance ;* at the same time it generally imparts great toughness, and tendency of the pills to fall out of shape ; *these are practical disadvantages.* I have had very little experience in the melting process, but I anticipate that it would be a great convenience to makers of pill masses on the large scale, obtained at the cost of great inconvenience to those who make only on the small scale, to those who use them in dispensing, and to those who swallow the pills.

Unfortunately, those who make pills, especially the wholesale makers, rarely have the opportunity of examining the condition of their workmanship after it has stood the test of a few weeks or months' keeping in the hands of the patient. The skilful dispenser who prides himself upon his accuracy and care, would often be ashamed of his work if he could see it a few weeks old.

A series of experiments which I tried some time since, though designed to yield information to be used in dispensing, elicited a few facts which may usefully aid our present purpose.

A variety of medicines were made into pills with treacle, soft soap, conserve of roses, and glycerine. After a few months' keeping, an examination showed that those prepared with glycerine had most effectually retained their soft condition.

A specimen of Pulvis Pilulæ Rhei Compositæ (prepared according to the London Pharmacopœia, but using powdered soap instead of soft soap, and omitting the treacle) made into a mass with glycerine was, while new, rather deficient in tenacity, but became tough on keeping for a few weeks, and retained its toughness for several months. A specimen of the same, made into a mass with treacle, was tough while new, but by keeping became crumbly.

Other medicines which have not adhesiveness in themselves may be made into a good mass with a mucilage of the following composition :—

Powdered Tragacanth ʒiij.
Glycerine, fʒix.
Mix and add Water, ʒiv.

Prof. Redwood, in his *Practical Pharmacy*, says "the indiscriminate use of tragacanth cannot be too strongly condemned;" he might have added that, if judiciously applied, there are few substances so generally useful for imparting tenacity, or overcoming the inconvenience of hygroscopic extracts, &c. For the former purpose its union with glycerine prevents it giving an undue hardness and insolubility, and for the latter purpose it is necessary only to use it in the smallest effectual proportion. Thus blue pills frequently have an inconvenient stickiness, which is effectually removed by the addition of twenty grains of powdered tragacanth to one ounce of the mass, which small quantity does not impart an objectionable degree of hardness.

A great number of pills contain aloes as their basis, and it, together with some other gum-resins, possesses abundant adhesiveness, but is very deficient in retentiveness of shape, nor is it an easy matter to supply this deficiency with any of the ordinary excipients, unless used in very large proportion. Conserve of roses, tragacanth, &c., are very unsatisfactory. Soap and glycerine, or soap and treacle, answer very well if the soap is used in considerable quantity ; but after numerous experiments I feel convinced that the most satisfactory method of managing this class of bodies is to add some ingredient of an insoluble and fibrous nature, which will form the framework of the pill ; and, for this purpose, nothing is better than woody fibre in a fine state of division, such as is obtained by putting sawdust through a sieve 40 × 40 meshes to the inch. Six grains of this "Pulvis Ligni" with six minims of glycerine will form thirty-six grains of extract of aloes into a good workable mass, divisible into ten moderate sized pills, which retain their shape perfectly for six or eight months, and, though they become very tough, still yield to the warmth of the hand. I do not know any other excipient which will effect so much without making the pills inconveniently large. There will probably be a feeling with many against the use of so vulgar a material as sawdust; if so, it might be replaced by pure lignin, or in some cases by Pulvis Cinchonæ, &c.

Mr. Muskett objected to my suggestion of omitting the Extract of Gentian in Pilula Aloes Composita, on the ground that the gentian increases the action of the aloes, and refers to Dr. Paris's Pharmacologia as his authority on this point. Dr. Paris's remark that bitters have the property of increasing the action of senna, and other aperients deficient in bitterness, scarce appears to apply to such a medicine as aloes. If Mr. Muskett's view be correct, Pulvis Cinchonæ would answer the double purpose of improving the physical as well as augmenting the medicinal properties of this preparation.

If the requisite quantity of dry excipient, soap, lignin, or gum, were ascertained, and ordered to be rubbed with the medicinal ingredients of the pill, and then an ascertained quantity of the fluid excipient, glycerine, water, mucilage, or spirit, directed to be added to the others, and the whole formed into a mass, I think it might be very safely left in the hands of the operator to choose for himself whether combination would be most conveniently effected by the use of the mortar or the water-bath.—*London Pharm. Journ. Feb.* 1860.

INTRODUCTION OF THE TEA PLANT INTO THE UNITED STATES.

A few years ago the United States Government was led to take measures for the introduction of the tea plant into the confederation, with a view to establishing, if possible, the preparation of tea in some of the States. The success that had attended Mr. Fortune's operation for the East India Company, having induced them to consult that gentleman, it was finally arranged that he should again proceed to the Celestial Empire, for the purpose of obtaining as abundant a supply of plants for the west as he had secured for the east. His mission has been attended with the most complete success. A minute of the United States Patent Office now before us, states that he was despatched in March, 1858, that he had obtained seeds enough to plant 100 acres, a large portion of which had arrived by the 20th June, 1859, and was flourishing in a propagating house, especially constructed at Washington for their reception. Applications for plants were even then made in such numbers, that it had become necessary to refer to Congress for instructions as to their disposal.

Mr. Fortune returned to England some time ago, and has favored us with the following interesting report upon the final result of his expedition :—

" It will be seen by the accompanying papers that the results of my expedition to China, for the Government of the United States, has been very satisfactory. In little more than one year about 50,000 tea plants, and many other vegetable productions useful in the arts, or of an ornamental character,* have been introduced to America from the tea countries of China.

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* For example : the Camphor and Tallow trees, Chusan Palm, green dye plant (Rhamnus), manure plants (Trifolium and Coronilla), Wax-insect tree (Fraxinus chinensis), Yang-mae (Myrica sp.), southern fruits, such as the Lee-chee, Longan, Wampee, &c. &c.

" This success was mainly owing to experience acquired during former visits to these countries. Arriving in China in the month of May, I spent the first few months in visiting numerous tea farms in different parts of the country, where I made arrangements with the natives for large supplies of seeds as soon as they ripened in the autumn. In October and November I repeated my visit to the same districts, and everywhere found supplies of seeds awaiting me. In former transactions with these tea growers, I had always treated them kindly and liberally, and I now found the advantage that resulted from such treatment. Seeds had been saved for me in all directions ; I had only to pick them up and proceed onwards, and was thus enabled to get through a large amount of work in a short space of time. In December I reached the seaport of Shanghai, with the whole of my collections in excellent condition.

" Tea seeds will not retain their vitality long if kept out of the soil. In order to guard against all risk, a large number of Ward's cases had been previously prepared and filled with earth, and to these the seeds were immediately transferred. The first shipment was made in December, a few days after my arrival in Shanghai. Knowing that the vessels would probably arrive in America in the middle or end of March, I thought it likely the seeds would remain in the earth without vegetating during the voyage. Instead, therefore, of sowing the seeds near the surface in the usual manner, I mixed up large quantities with soil, and filled the case up with the mixture of earth and seeds. By this simple plan many thousands of seeds were carried to their destination, and when they arrived there were as sound as if they had been all the winter on a Chinese seed-bed. Of course it was necessary to unpack them immediately on arrival, and sow them thinly in other quarters. In the other cases which were shipped later, this mode of packing would not have been safe. The seeds were therefore sown thickly and covered with earth in the usual manner, and in this state might vegetate on the voyage without any risk whatever. In the one case the object was to get the seeds quickly to their destination without vegetating, for had this taken place the experiment would have been a failure ; in the other they were placed in circumstances favorable for vegetation, and the only change likely to occur would be this, that in China they were only seeds, while towards the end of the voyage or at its termination they would have changed into healthy young plants.

"The watering, closing the cases, shipping, and last, but not least, securing the good-will of captain and officers, were all important operations."

Not only has the tea plant been thus introduced to the Eastern States, but it has found its way also to the Western; and our friends on both the Atlantic and Pacific sides are with their usual energy setting about growing it.

But there still remains the question whether they can turn it to profitable account. That their climate will be found to suit in some of the vast regions of the West there can be no reasonable doubt. But merely growing tea plants will not make commercial tea. The difficulty lies in the preparation of it, an operation which, as conducted in China, demands an enormous quantity of labor—the article of which beyond all others the United States have the least to spare. But is it really necessary to prepare tea Chinese fashion?—to chop it up into little balls and twist it into all sorts of queer shapes with all sorts of names, in order to give it its dietetical value? Surely not. We have ourselves found out that the painted article called green tea is not very wholesome and by no means the better for the paint; and we quite anticipate that our United States friends will have even already projected some sort of machine that will produce good marketable tea without the assistance of human hands. This indeed, we know, is the opinion of Mr. Fortune himself.—*London. Pharm. Journ. from Gardeners' Chronicle.*

CHEMICAL EXAMINATION OF CHIMAPHILA UMBELLATA.

(*Extracted from an Inaugural Essay.*)

By Samuel Fairbank.

The cold infusion of the leaves, made by displacement is turbid, of a reddish-brown color, acid to litmus, and possesses the odor and taste of the leaves. Solution of tannic acid causes no change, but if the infusion be boiled it becomes nearly transparent. Neither corrosive chloride of mercury nor ferrocyanide of potassium disturb the infusion when cold; but upon being boiled there is a whitish precipitate deposited, which being heated with potassa, gives no indication of the presence of nitrogen in the precipitate. I should infer from the above that albumen is not a constituent of the plant.

Tannic Acid.—The infusion is rendered *greenish-black* by the sesqui-salts of iron, which color is not dissipated by boiling. It is also precipitated by quinia and gelatin.

Starch.—The decoction yielded upon the addition of tincture of iodine the characteristic blue precipitate of *iodide of starch.*

Gum.—The infusion, deprived of its tannic acid by means of gelatin, filtered, and solution of subacetate of lead added, gave a white curdy precipitate. By first exhausting the leaves with alcohol, and then treating with water, a precipitate was produced, in the aqueous solution, by subacetate of lead.

Sugar.—An alcoholic extract, about the consistence of honey, was diluted with water and filtered. To a portion of the filtrate, in a test tube, was added a solution of sulphate of copper, and then caustic potassa in excess. It was carefully heated to ebullition and allowed to boil for a few minutes, when a reddish precipitate (Cu_2 O.) was deposited.

A test tube was filled with another portion of the solution, having been previously mixed with a few drops of yeast, and then inverted into a small evaporating dish, a little liquid being poured into the dish to prevent any escape from the test glass. It was then placed in a warm situation, where the temperature was about 85° F. The fermentation began almost immediately, and continued until the liquid was entirely displaced from the tube, showing the sugar to be in considerable quantity. The displaced liquid was found to possess a faint vinous odor, due to the alcohol formed.

The remaining liquid was evaporated with a view of obtaining crystals, but after evaporating until sufficiently concentrated, it solidified without showing any crystalline form. Repeated experiments were made to obtain the sugar in crystals, all of which, however, failed, the result being in all cases a semi-solid translucent, amorphous mass. I therefore, think that it is *uncrystallizable.*

Extractive.—A hot infusion, evaporated to the consistence of a soft extract, with the addition of water, when filtered, left upon the filter a considerable amount of a brownish-black substance, which was tasteless, insoluble in water, but soluble in alcohol and in alkaline solutions.

Pectic Acid.—A portion of the leaves, after being first exhausted by water to deprive them of coloring matter, was displaced with a solution of carbonate of soda, when muriatic acid being added to the alkaline solution it threw down a gelatinous precipitate, which, after drying formed laminæ. These upon the addition of water swelled considerably but remained undissolved. It was, however, soluble in solution of potassa, from which it was again precipitated by muriatic acid.

Resin.—A tincture was made with alcohol 0.835 and evaporated to about the consistence of syrup, and then thrown into water, which precipitated a considerable amount of resinous matter. This was thrown upon a filter, and washed with water and then with ether. This resin is a brownish-black substance, which is inodorous, hard, brittle, and fusible. It is insoluble in water, in ether, and in the fixed and volatile oils; but dissolves quite freely in alcohol, and is saponified by solution of potassa.

Fatty Matter.—The leaves, first exhausted with alcohol and then treated with ether and evaporated, left a small quantity of fatty matter. It communicated a greasy stain to paper, which was not dissipated by heat. It was soluble in the volatile and fixed oils.

Chlorophylle.—Chlorophylle was seperated by treating the ethereal extract with hydrochloric acid and precipitating the acid solution with water. The leaves also contain a *yellow coloring matter*, soluble in water and alcohol.

A tincture being made with diluted alcohol and agitated with chloroform, the mixture was set aside for some time until the liquids separated. The lighter solution was then drawn off, and the chloroformic liquid transferred to an evaporating dish and allowed to evaporate spontaneously, yielded a yellow crystalline substance. This was dissolved in alcohol, filtered, and allowed to evaporate spontaneously. By this means the crystals were rendered tolerably pure.

It was also obtained by simply distilling the *stems* with water. This substance, for which I propose the name of *Chimaphilin*, comes over and condenses in the neck of the retort, in the form of beautiful needle shaped crystals of a golden yellow color.

The stems yield a much greater proportion of chimaphilin than the leaves, both by distillation with water and by the chloroform process. The quantity of the crystals is neither diminished nor their beauty impaired by distilling the stems with a solution of caustic potassa.

Chimaphilin is neither acid nor alkaline to test paper; it is therefore, a neutral substance, of a golden-yellow color, insipid, inodorous, crystallizable, fusible; volatilizing without change and crystallizing in acicular crystals. The crystals vary in length according to circumstances, some of them are as much as an inch and a half long. It is certainly one of the most beautiful crystalline substances in organic chemistry. The crystals obtained by distillation are permanent in the air, but those prepared by the chloroform process are not, owing probably, to their not being perfectly pure. The latter assume an olive hue, ultimately changing to a purple, on exposure to the atmosphere.

Chimaphilin is insoluble, or nearly so, in water; soluble in alcohol, ether, chloroform and in the fixed and volatile oils, concentrated nitric acid does not effect it; sulphuric acid carbonizes it; chlorhydric acid produces no change. Its solution is not precipitated by corrosive chloride of mercury nor by tannic acid; many other reagents were tried without producing any change whatsoever.

The *pungent* principle of the stems resides in a resin, which was separated by agitating a tincture of the stems made with diluted alcohol with ether; drawing off the ethereal solution by means of a pipette, and evaporating. As thus obtained, however, it contains a small quantity of tannic acid and chimaphilin. The tannic acid can be removed by washing the resin with cold water, and the chimaphilin by chloroform, the resin being insoluble in either of these menstrua. It produces at first a cooling sensation in the mouth, somewhat like that occasioned by oil of peppermint, but in a few minutes becoming excessively pungent. It is soluble in alcohol and ether, but is insoluble in chloroform and in the fixed and volatile oils.

Ashes.—The leaves, on incineration, yielded 5.24 per cent. of ashes.

In examining the ashes they were first edulcorated, and the residuum boiled with chlorhydric acid, which produced quite a brisk evolution of carbonic acid. To a portion of the aqueous solution, tartaric acid was added which on standing deposited a crystalline white precipitate. Solution of bichloride of platinum also produced a precipitate. Antimoniate of potassa a white precipitate. Nitrate of silver a white precipitate of chloride of silver, another portion of the ashes dissolved in water acidulated with nitric acid, also gave a precipitate with nitrate of silver. Chloride of barium a white precipitate, insoluble in nitric acid.

To a portion of the acid solution supersaturated with ammonia, acetic acid was added which produced a precipitate (phosphate of peroxide of iron.)

Ferrocyanide of potassium yielded a dark blue, and tincture of galls a bluish-black precipitate. Oxalate of ammonia a copious white precipitate. Lime is very abundant in the ashes. Ammonia was added to the acid solution until supersaturated, then a solution of phosphate of soda precipitated the magnesia as the double phosphate of magnesia and ammonia. It was entirely soluble in chloride of ammonium.

The constituents of Chimaphila Umbellata may be summed up as follows:

Organic matter	94.75..
Inorganic "	5.25.
	100.00.

Organic.—Tannic Acid, Gum, Starch, Sugar, Pectic Acid, Extractive, Resin, Fatty matter, Chimaphilin, Chlorophylle, Yellow coloring matter, Lignin.

Inorganic.—Potassa, Lime, Magnesia, Iron, Chloride of Sodium, Sulphuric acid, Phosphoric Acid, Silicic Acid.—*Jour. and Trans. Md. Col. Pharm. March*, 1860.

ON SYRUP OF SQUILL PREPARED WITH DILUTED ALCOHOL.

By J. S. Conrad.

It has long been a custom of physicians to prescribe syrup of squill with a carbonate, when the effect of the carbonate is desirable: which cannot be done with our syrup prepared with acetic acid menstruum, without the loss of the acid gas. To the accomplishment of this end I have prepared a formula as follows:—

Take of Squill, (powdered,)	two ounces, troy.
Alcohol,	three fluid ounces.
Water,	one pint.
Refined Sugar,	two pounds troy.

Mix the squill with twice its bulk of coarse washed sand, introduce into a percolator, and place a tin diaphragm on the top. Mix the alcohol and water, and displace till 12 ounces are obtained, add the sugar, boil, evaporate to two pints and strain. This syrup has all the virtues of the squill in the same proportions as that by the Pharmacopœia, and if well prepared presents the same appearance.—*Ibid.*

ON THE PREPARATION OF ECBALINE, (ELATERIN), THE ACTIVE PRINCIPLE OF ECBALIUM OFFICINARUM.

By John Williams.

The *Ecbalium officinarum* (*Momordica elaterium*), or squirting cucumber, appears to have been employed as a purgative from the time of Dioscorides and Pliny, or possibly much earlier: and the so-called extract is the form in which it has usually been administered.

This *extract* is, as is well known to pharmaceutists, produced by a process totally different from that employed for the production of an ordinary extract.

The cucumber is sliced longitudinally, and subjected afterwards to gentle pressure, the juice thus obtained being allowed to remain at rest for ten or twelve hours, by which time a greenish feculent matter will have deposited. The clear supernatant liquor being rejected, the deposited matter is drained on a linen cloth, and afterwards dried at a very gentle heat, and thus we obtain the thin flaky pieces met with in commerce. As may be supposed, this extract is liable to very great discrepancies in strength and quality; for if the pressure used is great, a large percentage of inert matter will be expelled from the cucumbers, and thus the activity of the medicine will be reduced to an important extent.

The quantity of fine extract of elaterium which can be obtained is stated* to be about 3 drs. from one bushel of the fruit, weighing in the fresh state 40 lbs. Other authorities give quantities varying from 2 drs. to 4 drs., or even more, doubtless dependent upon the amount of pressure and washing the cucumbers were submitted to, and also the length of time the fluid was allowed to stand before the deposited matter was separated.

The activity of the extract of elaterium depends upon a white crystallizable body to which the name *elaterin* was formerly given, but for which the title *ecbaline* is proposed to be substituted. Pereira points out that the quantity of this principle contained in various samples of the extract of commerce varied from 44 per cent. to 33, 26, 15, and in a foreign article it may be found as low as 5 or 6 per cent. From an experiment of his own upon some extract very carefully prepared at Apothecaries' Hall, he concluded that 30 grs. yielded 7·5 grs. or 25 per cent.; and in a trial I have just made, 3 drs. of extract, purchased as the finest commercial article (taken as being probably equivalent to 1 bushel or 40 lbs. of the wild cucumbers), yielded me exactly 36 grs. of white crystallized ecbaline, equivalent to only 20 per cent.

Of course discrepancies like those are much to be deplored in medical practice, and if the active principle only was used in medicine, much greater certainty of effect would doubtless attend the administration of the remedy. The objection to the use of the ecbaline, however, has hitherto been the high cost of producing the article, thus rendering it almost impossible to employ the remedy in any but experimental trials. With a view of removing the obstacle, Dr. R. B. Garrod, one of the committee at present engaged in drawing up the new British Pharmacopœia, suggested that probably other portions of the fruit as well as the juice would, if properly treated, yield a large quantity of the active principle, and proposed to Messrs. Savory and Sons, and afterwards to our firm, that we should experimentally test the feasibility of his process. Upon consulting together, it was determined that the operations should be conducted in our laboratory, and I have now the pleasure of laying the results of our inquiries before the profession.

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* Pharmaceutical Journal, vol. i. New Series, p. 325.

Dr. Garrod's proposed process for the production of the ecbaline was as follows:—The cucumbers are to be sliced and dried at a gentle heat, but so that no loss of juice shall occur. The dried fruits to be treated with alcohol, and the alcoholic extract thus obtained acted upon with solution of potash, in which the starch, green coloring matter, &c., is soluble, but in which the ecbaline is not only insoluble, but remains perfectly unaffected by the powerful reagent employed. The residuum, therefore, dissolved in alcohol and crystallized, will of course give the ecbaline in a state easily rendered quite pure by a subsequent solution in alcohol, digestion with animal charcoal, and re-crystallization.

It appeared reasonable that by this process *all* the ecbaline contained in the cucumbers would be extracted, whereas by the ordinary process of making the extract, it may be supposed some, or even a large quantity of active principle, may be left in the plant.

One bushel (weighing 40 lbs. in the fresh state) of wild cucumbers were acted upon. They were carefully sliced longitudinally upon an inclined slab, so that any juice yielded during the operation would flow into a vessel placed for its reception. The cut cucumbers were then placed on a sieve for 12 hours (but were not pressed in any way), and then placed in earthen pans, in a warm closet, where in the space of 4 days they became completely dry. In this state they weighed 3 lbs. 5 oz. The liquor which had drained from the cucumbers during the cutting and draining was evaporated to dryness by itself at a gentle heat, and yielded 3 oz. extract: this we will call extract No. 1.

The dried cucumbers were now placed in a digesting apparatus, with 2 gallons of alcohol, and the temperature was raised to the boiling point. Afterwards they were allowed to digest for 24 hours. Then the tincture was drained and the operation repeated with another 2 gallons of alcohol. The mixed tinctures when filtered, presented a bright green color, and being placed in a still the alcohol was drawn over. A small quantity of green extract was the result: this extract we will call No. 2.

The extract No. 1 (the evaporated juice) was treated with successive portions of boiling alcohol, until nothing more could be extracted; the filtered tinctures, evaporated to dryness, gave a small quantity of greenish extract. This greenish extract was then treated with about 8 times its bulk of hot liquor potassa. After digesting for a short time, the greater portion of the matter dissolved, leaving, however, when filtered, washed, and dried, 30 grains of nearly white crystalline matter, which proved to be the ecbaline we were in search of.

Extract No. 1 was treated in like manner, and yielded 57 grains of matter, insoluble in liquor potassa, but of a dark greenish-brown color. Both these deposits were then dissolved in boiling alcohol, a very small quantity of pure animal charcoal added, filtered, and allowed to crystallize.

The matter from extract No. 1 yielded 28½ grs. of ecbaline, white and crystallized. The matter, however, from No. 2 extract refused to yield crystals, and gave only a dark colored fatty mass, which after another trial at crystallization yielded no better result. It was then attempted to dissolve the fatty matter from any ecbaline which might be present by means of a small quantity of cold ether, but no good effect was produced, the whole mass dissolving freely in that menstruum, whereas ecbaline is but slightly soluble in it.

The result of the experiment appeared so unsatisfactory and so different from what was anticipated, that I determined to repeat the experiment, though in a rather different manner.

One bushel of wild cucumbers was again taken. They were cut up with the same precautions as before, catching all the juice carefully; then well bruised in a large mortar, the mass placed upon sieves and allowed to drain. They were then stirred up with about their own bulk of cold water, allowed to drain, and then subjected to strong pressure through very coarse canvas. By this means a considerable amount of juice was obtained, which upon standing separated into three portions—an insoluble green deposit (the extract of elaterium), and a large quantity of coagulated chlorophyll, floating in a clear aqueous liquid. The whole was thrown upon a calico filter, and the solid matter, after being well drained from the liquid portions, dried between chalk stones. When dry it weighed 2½ oz. The aqueous portion was evaporated to the consistence of an extract.

The mass of the cucumbers, after the juice had been thus pressed out, was dried as in the first experiment, digested in boiling alcohol twice, and the mixed tinctures strained and distilled. The amount of extract yielded, was, as might be expected, much smaller in quantity than on the previous occasion.

First, the solid matter which had been strained from the juice (which I look upon as equivalent to the ordinary extract of elaterium, though not in so pure or concentrated a form) was treated with successive portions of boiling alcohol until nothing more would dissolve, and the mixed tinctures evaporated to dryness. This we will call extract No. 1.

Then the extract produced by evaporating the aqueous liquor was treated with alcohol, and yielded a small quantity of brown extract, which we will call No. 2.

The thin alcoholic solution of the cucumber-mass, upon standing, separated into two portions. The more liquid portion was evaporated by itself to dryness: this constitutes No. 3; the solid portion of the alcoholic extract of the mass No. 4.

The several extracts were then treated with hot liq. potassæ, and allowed to digest for some hours, then, somewhat diluted, were filtered, washed and dried.

The dried precipitates were treated with boiling alcohol and filtered, and the alcohol, allowed to evaporate, gave the following results:

No. 1 extract yielded nearly 25 grains of nearly white crystallized ecbaline;

No. 2, 38 grs. of a dark brown non-crystallizing mass, which appeared to possess none of the properties of ecbaline;

No. 3 yielded 10 grains of a much lighter and crystalline mass, which probably by future purification will yield a few grains of ecbaline;

No. 4 yielded 14 grains of green waxy matter.

The chlorophyll and residual matter which had refused to dissolve in the boiling alcohol to form extract No. 1, was treated with liq. potassæ, by which means a large portion was dissolved, and that which remained behind was again boiled in alcohol; but the result was only a few grains of brown extractive matter quite free from ecbaline.

The conclusion which must be drawn from these experiments is, I think, that the mass of the cucumber after separation of the juice contains so small a quantity of ecbaline that the loss of alcohol and working expenses would not be covered by the value of the substance produced: that the only portion which yields ecbaline is the insoluble deposit from the juice, which we already know under the name of extract of elaterium, this substance yielding the ecbaline with ease: and that the aqueous portion of the juice is perfectly worthless for the purpose.

Thus we find that the quantity of ecbaline yielded by the large bulk of one bushel of cucumbers is only at most 30 grains, and as the labor and expense attendant upon the operation is considerable, it must be evident that the substance must remain a very expensive one to manufacture ; and I am inclined to think it very probable that ecbaline can be made (at any rate in London) at a cheaper rate from ext. elaterium itself than direct from the cucumbers.

I may add in conclusion that through Messrs. Savory and Sons I have been able to operate upon some German extract of elaterium. This extract is in appearance similar to ordinary extract of henbane, or liquorice, and is evidently obtained from the plant itself, and was sold as low as 10*s.* 6*d.* per lb. It was imagined that this extract might be a cheap source for the production of the ecbaline. One ounce of it was digested with boiling alcohol and the alcoholic extract prepared, which was then treated with the solution of caustic potash in the same manner as the other extract ; but I have been unable to obtain even the slightest trace of crystalline matter from it. It would be interesting to know whether the extract itself has *any* cathartic action.—*Chemical News*, *London Feb.* 1860.

RESEARCHES ON SOME ORGANIC ACIDS.

By Profeesor J. Liebig.

Pelouze reported to the French Academy, the discovery of the artificial formation of tartaric acid, by Liebig, (see page 86 of this volume,) when Biot suggested that the optical behaviour of this artificial acid might be investigated by certain experiments, which have now been performed by Dr. Bohn, of Munich. The result was, that Liebig's acid deviated the polarized light to the right, and that this deviation is increased by a trace of boracic acid; therefore the identity of it with the natural acid is also established by the optical properties.

Liebig's discovery may throw some light on certain organic processes within the vegetable cells. Unripe grapes contain tartaric acid, which gradually disappears, giving place to sugar, a carbohydrate in the ripe grapes, and inasmuch as by oxidation of carbohydrates tartaric acid may be produced, we may assume, that by the reverse process, the plant may transform tartaric acid into sugar. In compliance with the elementary composition of tartaric acid, it may, according to Liebig, be viewed as oxalic acid, one half of which has been transformed into, or which is copulated with a carbohydrate. Similar relations are doubtless existing between malic and citric acid, and the non-azotized products, starch, pectin, &c., which occur with these acids in the same plants.

Late experiments performed in Liebig's laboratory, have led to the unlooked for results, that by a simple oxidation, namely, on heating with black oxide of manganese, malic acid will yield aldehyde and citric acid, aceton. Malic acid may be considered as oxalic acid copulated with aldehyde: $2\ C_4\ H_2\ O_4 = 2\ C_2\ O_3 + C_4\ H_4\ O_2$, and pyrocitric acid, which is generated by the influence of heat upon citric acid, as oxalic acid copulated with aceton: $C_5\ H_3\ O_4 = C_2\ O_3 + C_3\ H_3\ O$.

Further investigations in this direction will no doubt throw some light on physiological processes, hitherto not understood.—*Buchner's N. Rep.* viii. 515, 516. J. M. M.

ON THE OIL OF CAMPHOR.

By M. Lallemand.

Some years ago M. Biot submitted to M. Lallemand two vegetable products for examination. The first was the oil of the *Dryobalanops Camphora* collected by the well known Dutch savant, Dr. Junguhn, whilst jurneying in the north-west of the island of Sumatra. The second, already known as *oil of camphor*, had been extracted from the *Laurus Camphora*, a plant which also furnishes the camphor of Japan. "The results at which I have arrived," says M. Lallemand, "differ with those already mentioned in works on chemistry, and render very probable the fact that the product analysed by M. Pelouze under the name of *essence of Borneo* had not been extracted from the *Dryobalanops Camphora* (the largest tree of the Indian Archipelago)." The researches contained in the author's paper show that the oil of Dryobalanops is a complex mixture analogous to the turpentine obtained from pines and firs. Its origin would make us suppose that it contained Borneo camphor: M. Lallemand assures us, however, that it does not contain a trace. The oil which exudes from the tree by incision does not differ from that obtained by decoction; they have both the same rotatory power and the same viscosity. The quantity experimented upon was too small to permit of further research. The camphor oil extracted from *Laurus Camphora* has already been analysed by Martius and Richer, who looked upon it as a first degree of oxidation of camphor, and represented it by the formula $C_{20}H_{16}O$. Gerhardt supposed it to be a mixture of camphor and a hydrocarbon, and M. Lallemand confirms this view.

"I have also determined," says the latter author, "the composition of some of the most abundant essences of the *Labiatœ* family, which I possessed in a pure state. The essential oil of *rosemary*, of *common lavender* (*Lavandula spica*) and *cultivated lavender*, consist of mixtures analogous to oil of camphor, and show us to what extent the molecule $C_{20}H_{16}$ and its immediate derivatives are distributed throughout the vegetable world.—*Chem News, Jan.* 14, 1860 from *Rep. de Pharm., Oct.*, 1859.

ARABIAN MANNA.

Dr. Landerer, pharmaceutist to the King of Greece, and Prof. of Chemistry in the University of Athens, publishes the following notice of this article. The Arabians call the root of *Cyperus Esculentus* Manna. It is one of the most useful plants to them as food, side-dish and dessert, thanks to its pleasant almond taste. In case of sickness, they make a pleasant-tasting sherbet of this root, preferable to the best milk of almonds, and the syrup, prepared from an emulsion of the *Cyperus*, will keep longer than that from almonds. The different varieties of Sherbet, sold in the streets of Alexandria and Cairo, resembling milk of almonds, are prepared from this manna. Hundreds of quintals of it are brought from the interior of Africa to the bazaars of Cairo, Smyrna, Magnesia, Constantinople, and especially Alexandria, whence it comes to Greece during the autumnal months. A wine glass full sells at from 10 to 15 lepta. They do not sell it, like other fruit, by weight, but by measure; for which a glass is always used. The racines, which are called ground almonds, contain much oil that can be extracted by roasting; it is a fixed oil of a very pleasant taste, and very similar to that of almonds and sesame. It is separated on a large scale in Egypt, where it is employed for a variety of purposes, although it becomes rancid very quickly. The plant, so useful, is multiplied by tubercles, and prospers, particularly in sandy soils, to such an extent that large plains are entirely covered by it. The sand is separated from the tubers by means of a sieve; bags made of camel's hide are filled with them, and they are carried by camels in the caravan to Cairo, where they are dried and placed in the warehouses devoted to this business. The poorer class, after roasting them, use them to prepare a very pleasant coffee, which, whether pure or with milk, is possessed of more nutritive properties than ordinary coffee. In consequence of its tuberculous form, the racine was called by Dioscorides *Olokonitis*, and Pliny designates it by the name *Anthalium.*—L. H. S. *Journ. Md. Col. Pharm., March,* 1860.

OXYSULPHURET OF ANTIMONY.

M. Jacobi has made known in France the art of preparing and preserving oxysulphuret of antimony according to the Prussian Pharmacopœia, which gives a receipt for a very fine product.

1500 parts of ordinary carbonate of soda are dissolved in 7500 parts of water; and to this solution are added 500 parts of lime, rendered semi-liquid by the addition of 1500 parts of water; to this mixture 100 parts of black sulphuret of antimony are added together with 125 parts of sulphur. The whole is boiled for an hour and a half, water being added now and then to replace that which is evaporated. The residue is again boiled with 3000 parts of water, the solution is then filtered and the filter washed with warm water. The liquid is allowed to rest, and the crystals obtained washed with distilled water, to which $\frac{1}{100}$ of potash is added; they are then dried. 500 parts of these crystals are dissolved in 2500 parts of water, the solution filtered and diluted with 12,500 parts of water. To this is added a mixture of 150 parts of sulphuric acid with 4000 parts of water. The precipitate formed is collected on a filter, washed first with ordinary water, then with distilled water, pressed between folds of blotting paper, dried at a temperature of 77° Fahrenheit, reduced to powder and preserved in a black bottle removed from the light. The drying at a low temperature, and the washing with distilled water, are two important conditions whereby the preservation of the product is assured.—*Chem. News, Dec.* 31, 1859, from *Jour. de Ph. Nov.*, 1859.

SYNTHESIS OF OXYGENATED BASES—ARTIFICIAL ALKALOIDS

M. Wurtz has shown recently that oxide of ethylen can be united directly with water, and form monoethylenic alcohol (glycol), diethylenic and triethylenic alcohol, according as these combinations take place between 1, 2, or 3 atoms of oxide of ethylen and 1 atom of water.

The same author now makes known that oxide of ethylen will unite with ammonia without elimination of water; that is, all the elements of oxide of ethylen combine with all the elements of ammonia and form oxygenated bases remarkable for their energetic properties. To prepare them, oxide of ethylen is added to a concentrated solution of ammonia, and the mixture left to itself. If care be not taken the whole explodes with a powerful detonation, for the reaction produces much heat. When the experiment is conducted properly a syrupy alkaline matter is obtained. This is neutralized with hydrochloric acid, and the solution, sufficiently evaporated, produces colorless rhombohedric crystals which contain

$$C_6H_{15}NO_3, HCl.*$$

A solution of these crystals forms a double salt with chloride of platinum. The supernatant liquid, from which the crystals in question have been deposited, contains another chloride, which cannot be crystallized, but which gives also a double salt with chloride of platinum.

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*C 12,=H=1, N=14, O=16.

The first platinum salt contains the elements of 1 atom of ammonia and 3 atoms of oxide of ethylen; the second platinum salt contains the elements of 1 atom of ammonia and 2 atoms of oxide of ethylen.

We have therefore two new oxygenated bases:

$$\text{1st. } 2\underbrace{C_2H_4O}_{\text{Oxide of ethylen.}}+NH_3=C_4H_{11}NO_2$$

$$\text{2nd. } 3C_2H_4O+NH_3=C_6H_{15}NO_3$$

which in the state of chlorides combine with chloride of platinum, as chloride of ammonium, of potassium, &c. do. There seems to be no reason why compound ammonias should not react in the same manner; and the above furnishes us, doubtless, with reactions which will become a fertile source of artificial oxygenated alkaloids; moreover, they seem to confirm an idea conceived by Berzelius, that alkaloids contain ammonia already formed.—*Chem. News*, *Dec.* 31, 1859 from *Comp. Rend.*, *Dec.* 5, 1859.

ALCOHOL IN THE ANIMAL ORGANISM.

It is usually supposed that the alcohol which enters into the circulation, through the digestive organs, is rapidly destroyed under the influence of the oxygen by the respiratory process. This oxidation may indirectly produce in the blood, carbonic acid and water, or according to the general view, it suffers a series of changes into compounds more oxygenated than before; aldehyde, acetic acid, oxalic acid, carbonic acid. The amylaceous, and saccharine and fatty bodies suffer a similar decomposition; and brandy, beer, cider and the spirituous liquors in general, would therefore be related to the supporters of respiration.

This theory, founded upon experiments which appear to be incontrovertible, explains in a satisfactory manner, why no alcohol, or only traces are discovered in the blood and urine.

The results of experiments which have lately been reported to the Paris Academy, by M. Duroy, Lallemand and Perrin, are in most cases at variance with this theory; they prove, on the one hand, that alcohol is not destroyed in the blood because it is met with in all liquids and tissues, which do not contain its products of oxidation, and on the other hand, that it is secreted in various ways by the lungs, the skin, and particularly the kidneys.

The following are the conclusions at which they arrive :

1. Alcohol merely acts upon the nervous system ; it is no supporter of respiration.
2. Alcohol is neither destroyed nor altered in the body.
3. Alcohol concentrates chiefly in the liver and brain.
4. These facts explain the pathology of certain organic and functional mutations of the liver, brain and kidneys.—*Gaz. Med. de Paris*, 1859, *No.* 46. *Buchner's N. Repert.* viii. 518, 519.

J. M. M.

ON THE AMOUNT OF CANTHARIDIN CONTAINED IN DIFFERENT PARTS OF THE BODY OF THE CANTHARIS VESICATORIA.

By M. Ferrer.

Various opinions have been expressed on the question whether the cantharidin is equally distributed all through the body of the insect, or whether it exists only in certain parts to the exclusion of the others. Pliny, Galen, and Aetius believed that the elytra had no action. Hippocrates recommended that the head with its antennæ, the elytra, the membranous wings, and legs should be rejected, as he considered them completely inert. This opinion was adopted by Schwilgué in the third edition of his *Materia Medica*, which appeared in 1818. Latreille, Cloquet, and Audoin, on the contrary, assert that all parts of the body contain cantharidin.

In 1826, M. Farines, a pharmacien at Perpignan, having tried, without effect, plasters prepared separately with the powder of tho elytra, wings, antennæ, and legs, returned to the opinion of Hippocrates, and in a note addressed to the Société de Pharmacie of Paris laid down the follwing conclusions :—

1. That the active part resided only in the soft organs.
2. That the hard organs do not possess any vesicating power.

In 1855, M. Courbon, in a memoir presented to the Academy, also said that the vesicating principle of cantharides resided only in the soft or internal parts ; but in opposition to M. Farines he contended that the soft parts of all regions possessed a vesicating property; that the soft or internal parts of the legs and head are as active as those of the thorax and abdomen, and that the only parts of the body completely inert are the elytra, the antennæ, and the portions of the feet composed only of hard parts.

In 1856, M. Berthoud sought chemically for cantharidin: 1, in the abdomen and thorax, which he designated the *soft parts* of the flies; and 2, in the elytra, wings, antennæ, and feet, which he called the horny parts:

250 grammes of the abdomen and thorax gave 0·45 of cantharidin.

125 grammes of the horny parts gave 0·053.

These results, completely opposed to the conclusions of M. Farines, do not, however, demonstrate the existence of cantharidin in every part of the body of the fly. They only serve to confirm the opinion and the observations of M. Courbon. The parts which M. Berthoud has named collectively the horny parts, and from which he has extracted the cantharidin, contain in their interior a certain quantity of soft parts (the soft parts of the head and legs) and the cantharidin might be obtained exclusively from these soft parts if the observations of M. Courbon were strictly true.

On a question so interesting and as it appeared to me so imperfectly resolved, I thought it would be useful to make some new researches. To ascertain whether cantharidin is indifferently distributed over every part of the body, or whether it is only contained in particular parts, I have sought for it,—1, in the feet and legs; 2, in the head; 3, in the elytra and wings; and 4, in the thorax and abdomen.

First experiment:—11 grammes of the feet and legs were powdered and treated in a displacement apparatus with 25 grammes of chloroform; after macerating for three days the liquid was run off and the chloroform displaced by means of alcohol. The chloroform so obtained was allowed to evaporate in the air, and the residue was placed between folds of blotting paper to absorb the oil. The crystals left were redissolved in a small quantity of chloroform, again crystallized and then weighed. From the 11 grammes of the feet, 0·01 of cantharidin was obtained, still stained with a little of the green oil.

Second experiment:—17 grammes of the head and antennæ (there were very few antennæ) were treated with 35 grammes of chloroform, like the preceding, and from them 0·015 of cantharidin was obtained.

Third experiment:—11 grammes of the elytra and membranous wings were treated with 25 grammes of chloroform, and yielded 0·009 of cantharidin.

Fourth experiment:—30 grammes of the thorax and abdomen were mixed in a displacement apparatus with 70 grammes of chloroform. In this experiment the residue obtained by the spontaneous evaporation of the chloroform, furnished a large quantity of crystals. After having absorbed the oil and redissolved the crystals in a small quantity of chloroform, I threw the solution on a filter. After filtration I opened the paper and found it covered with small micaceous crystals of cantharidin perfectly white. The chloroform had deposited the crystals as it evaporated, and the green oil had passed through with the chloroform which had not evaporated. As this last portion might still contain a small quantity of cantharidin, I evaporated and again dissolved it in a little chloroform, and threw it on a filter as before. After repeating this a third time I obtained all the cantharidin furnished by the 30 grammes of the thorax and abdomen perfectly white. It weighed 0·072 grammes.

The blisters produced on my arm by a very small quantity of the crystals obtained in my experiments, left no doubt of their nature. From these experiments the author draws the conclusion that the active principle of cantharides is found distributed over all parts of the body.—*Chem. News*, Jan. 21,* from *Rep. de Pharm.*

ON THE PREPARATION OF THE UNGUENTUM HYDRARGYRI NITRATIS, (PH. L.)

By Julius Schweitzer.

No preparation of the London Pharmacopœia is more difficult to obtain of a constant and uniform appearance and consistence than the unguentum hydrargyri nitratis. The ingredients which enter into the composition of this ointment are lard, olive oil, mercury, and nitric acid; and it is directed to be prepared by first dissolving the mercury in the nitric acid, and then mixing the solution while hot with the lard and olive oil previously melted together. When successfully made the ointment should be, 1, of a pure pale yellow color; 2, of a soft and uniform consistence; and 3, should be able to retain its color and softness unchanged. When the acid mercurial solution is mixed with the melted lard and oil, we observe a chemical action accompanied by a rise of temperature to take place, which is more or less observable according—1, to the state of the mercurial solution; 2, to the temperature of the lard and oil at the time the solution is added; and 3, to the amount of stirring employed to effect the combination. The chemical action arises from the influence of the nitrous acid in the mercurial solution on the lard and oil. The warmer the fats, the richer the nitric solution in lower oxides of nitrogen, and the more energetic the stirring, the more sudden will the chemical action take place, and the higher will rise the temperature of the mixture; and on the contrary, the cooler the fats, the poorer the mercurial solution in nitrous acid, and without stirring, the mixture occasions scarcely any chemical action and rise of temperature at all. As a sudden and high temperature is always detrimental to the ointment, we must especially guard against this, which is perfectly in our power. But as we have to assist, and to some extent develope, chemical action to produce the ointment, we must remember, 1, that the *larger* the amount of nitrous acid in the solution the *lower* must be the temperature of the fats when the mixture is made; and 2, that the *poorer* in nitrous acid the *higher* may the temperature of the fats be. It must always be borne in mind, however, that ointments whose temperature in the making rises above 212° Fahr. will turn out dark in color and hard in consistence, even if the color and consistence is tolerably good when first made; but those which are made at a lower temperature will always prove unobjectionable in every respect.

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*Dr. Leidy (see page 157 of this volume) shows that cantharidin exists in the blood of the insect and in certain organs near the generative organs.—Ed. Am. Jour. Pharm.

I divide the preparation of this ointment into three periods. I allow the solution of the mercury in the nitric acid to go on slowly during the night. The next morning I melt the lard, and after the acid solution is added I watch the chemical action during the day. The following morning the preparation is finished in the manner hereafter described.

As the nitrous acid is the most essential agent in the formation of the ointment, I effect the solution of the mercury so as to lose as little of this acid as possible. I therefore allow the solution of the mercury to go on spontaneously in the cold and in a tall covered jar. I avoid hereby trouble and inconvenience; and in the morning I find a complete solution, cold and ready for use. In the morning I melt the lard on a water bath, strain it into an open glazed pan, and add the oil to it cold to lower the temperature. I stir the two well together, and wait until the mixture is about 130° Fahr., when I pour the mercurial solution gently into it, and allow the whole to stand undisturbed for some time. When the ointment begins to set at the sides of the vessel, and on the surface, I move these solid portions gently, and guide them into the warmer part, and wait again until it is necessary to repeat this operation, now and then drawing the spatula backwards and forwards through the entire mass. As the whole becomes firmer and firmer, I increase the stirring, and continue it at intervals through the whole day. The next morning I find a spongy mass with a high raised crust, rather harder than the interior portion, and generally a small quantity of acid liquid at the bottom of the pan. I now stir and beat the mass vigorously for some time until the spongy ointment softens under the spatula, and the liquid becomes thoroughly mixed, when the color becomes of a beautiful canary yellow, and my care and trouble are rewarded with an ointment everything that can be desired in appearance and consistence. I have still to add a few words on the ingredients and materials which concern this ointment. First of all I select the finest and best lard, as the goodness of the ointment, its color and keeping properties, depend a good deal on the quality of this article. Next, I avoid the use of all materials which are likely to be acted on by the acid solution. Even the wooden spatula of the laboratory I suspiciously discard for one of stone ware; and when I have my lard and oil, mercury and nitric acid in proper condition, my last look is to see that my vessels are really perfectly clean.—*Chem. News*, *Feb.* 11, 1860.

Varieties.

Waterproof Varnishes.—Take one pound of flowers of sulphur and one gallon of linseed oil, and boil them together until they are thoroughly combined. This forms a good varnish for waterproof textile fabrics. Another is made with 4 lbs. oxyd of lead, 2 lbs. of lampblack, 5 oz. of sulphur and 10 lbs. of India-rubber, dissolved in turpentine. These substances, in such proportions, are boiled together until they are thoroughly combined. A patent has been secured for the application of such varnishes to waterproof fabrics, by N. S. Doge, of London. Coloring matters may be mixed with them. Twilled cotton may be rendered waterproof by the application of the oil sulphur varnish. It should be applied at two or three different times, and dried after each operation.—*American Druggists' Circular, April*, 1860.

Protecting Young Trees with Blood.—With regard to the protection of young trees against the attacks of rabbits, mice, and other animals obnoxious to the vitality of vegetation, a Missourian correspondent (Dr. J. Dinkley) says:—"I will give you a much better remedy than any previously proposed. Rub the trees, from the ground upward to about 18 inches, with a piece of raw, bloody meat—liver is the most convenient thing; or blood may be put on with a brush. If this be done late in the fall or beginning of winter, no animal will touch the bark during that season. I have tried this plan for *thirty years*, and have never known it fail. Let horticulturists try it."—*Ibid.*

Colored Flames.—Bibulous paper soaked for ten minutes in a mixture of 4 parts by measure of oil of vitriol with 5 parts of strong fuming nitric acid, and then washed out thoroughly with warm distilled water, is to be dried at a gentle heat. The gunpaper thus prepared is then saturated with chlorate of strontium, with chlorate of barium, or with nitrate of potassium, by immersion in a warm solution of these salts; a solution of chlorate of copper also may be used. If, after complete drying, a small pellet of any of these papers be made, lighted at one point at a flame, and then thrown into the air, a flash of intensely-colored light is produced, while the combustion is so perfect that there is no perceptible ash. The barium salt gives a beautiful green light, the strontium-salt a crimson, the potassium-salt a violet, and the copper-salt a fine blue. The chlorates may be prepared sufficiently pure for these experiments by mixing warm solutions of the chlorides of barium, strontium, or copper, with an equivalent quantity of a warm solution of chlorate of potassium. The clear liquid is to be poured off the precipitated chloride of potassium, and employed for the saturation of different portions of the gun-paper. The foregoing makes an admirable lecture-experiment, for illustrating the colors of the barium, strontium, and other flames.—*A. H. Church.—Chem. News, Dec.* 24, 1859.

Bitumenized Paper Tubing.—An experiment was recently made under the great clock tower, Westminister, for trying the strength, by hydraulic pressure, of a new description of tubing, composed of bitumenized paper, invented by M. Jaloureau, of Paris. M. Jaloureau is a contractor for paving Paris and other towns in France with bitumenous concrete. It happened in the course of his experiments that some paper which had been coated with bitumen was laid aside in a coiled form, and after some time it became very stiff and solid. Pursuing the idea which thus accidentally occurred to him, M. Jaloureau put several layers of bitumenized paper round a cylinder, and submitting them to internal pressure, he found that a tube a quarter of an inch in thickness was capable of resisting a pressure of 250 lbs. to the square inch. The municipal authorities of Paris tried these tubes for the conveyance of gas, and in the recent experiments made here a piece of tube was produced, which, though stated to have been under ground in Paris as a gas pipe for twelve months, had the appearance of being a new pipe. The tubes subjected to the pressure of the hydraulic pump bore a strain of 250 lbs. to the square inch without bursting, which is more than they would be ever called on to bear in ordinary use. One of the tubes, half an inch thick, and with a bore of two inches, was also tested by weight, and it only gave way to a pressure of 428 lbs. the bearings being three feet apart. It was stated that the tubes might be submitted to a temperature of 160 degrees of Fahrenheit without any deterioration of the material. The cost of the tubing is said to be less than half that of the ordinary iron piping. Messrs. Paul Joske and Alexander Young are the patentees of the invention in this country.—*Chem. News, Feb.* 11, 1860.

To make Paper Waterproof.—Dissolve 8 ounces of alum and 3¾ ounces of white soap in 4 pints of water; in another vessel dissolve 2 ounces of gum arabic and 4 ounces of glue in 4 pints of water. Mix the two solutions and make the mixture hot. Immerse the paper in the mixture, and then hang it up to dry or pass it between cylinders.

The alum, soap, glue and gum form a sort of artificial covering which protects the surface of the paper from the action of water, and to a certain extent from fire. This paper will be very useful for packages which may be exposed to the inclemency of the weather.—*Ibid. from Monitor de la Salud.*

Minutes of the Philadelphia College of Pharmacy.

Hall of the College of Pharmacy, 3d mo. 26, 1860.

The 39th Annual Meeting was held this evening. Present 22 members. Charles Ellis, President, in the Chair.

The minutes of the last meeting were read and approved.

By the reading of the minutes of the Board of Trustees, the College was informed of the election of the following resident members: E. Raphael Perrott, Robert England, John E. Carter, Henry F. Geyer.

Roger Keys being recommended by the Board for resident membership, a ballot was ordered, T. Clarkson Griffith and S. S. Bunting acting as tellers. They reported his unanimous election.

The following list of graduates of the School of Pharmacy, is taken from the minutes of the Board. They received the degree of Graduate in Pharmacy at the late Commencement.

GRADUATING CLASS			SUBJECT OF THESIS.
Bell, Wm. D.	Hagerstown,	Maryland,	Manganese and its oxides.
Bolton, Joseph P.	Germantown,	Pennsylvania,	Geranium Maculatum.
Boyd, John W	Cleveland,	Ohio,	Cytisus Scoparius.
Bryan, John E.	Philadelphia,	Pennsylvania,	Diospyros Virginiana.
Claypoole, John	Wilmington,	Delaware,	Grana Paradisi.
Coleman, Francis A	Montreal,	Canada,	Gelatines.
Cowell, C. M	Currituck,	N. Carolina,	Capsicum Annuum.
Creecy, William Pryor	Vicksburg,	Mississippi	Liquidambar Styraciflua.
Franklin, Thomas H.	Philadelphia,	Pennsylvania,	Chimaphila Umbellata.
Fritsch, Herman	——	Prussia,	Carypha pumos.
Fronefield, Jr., Charles	Philadelphia	Pennsylvania,	Phellandrium aquaticum.
Gegan, James J.	Philadelphia	Pennsylvania,	Phytolacca decandra.
Haehnlen, Jr., Jacob F	San Francisco,	California,	Achillea Millefolium.
Keffer, Frederick A.	Philadelphia,	Pennsylvania,	Sabbatia Angularis.
Kemble, Henry B	Harrisburg,	Pennsylvania,	Stilliugia Sylvatica.
Link, Ferdinand	Wurtemburg,	Germany,	Practical arrangement of a Drug and Prescription Store.
McIlvane, J. L	New Orleans,	Louisiana,	Vinum Ipecacuanhæ.
Macpherson, William	Philadelphia,	Pennsylvania,	Chelidonium Majus.
Mecray, Alexander M	Cape Island,	New Jersey,	Leptandra Virginica.
Newman, George A	Chambersburg,	Pennsylvania,	Caulophyllum thalictroides.
Parrish, William G.	Burlington,	New Jersey,	Podophyllum peltatum.
Rulon, Edwin	Swedesboro,	New Jersey,	Cortex Caryæ Amaræ.
Sheridan, John I	Philadelphia,	Pennsylvania,	Foreign and Amer. Ipecacuanha
Vogeloach, Herman A.	Philadelphia,	Pennsylvania,	Regnum Vegetabile.
Wagner, Joseph.	Philadelphia,	Pennsylvania,	Asclepias tuberosa.
Wells, James G	Norristown,	Pennsylvania,	Geranium Maculatum.
Wendel, John	Philadelphia,	Pennsylvania,	Sporula Lycopodii.
Wilson, James	York,	Pennsylvania,	Druggists and Drugs.
Winter, Jonas	Hagerstown,	Maryland,	Oleum Arachis hypogæa an Oleum Siuapis.

The following is an abstract of the Annual Report of the Library Committee to the Board of Trustees, taken from the minutes:

"The Committee on the Library have received the following donations of books since their last Annual Report, viz.:—From Dr. Robert Bridges, 4 vols.; W. C. Bridges per Dr. Bridges, 5; Samuel F. Troth, 3; A. J. Brazier, 46: H. Leuchsenring, 5; W. R. Warner, 4; Henry A. Tilden, 2; Merrihew & Thompson, 2; Samuel S. Garrigues, 3; Wm. J. Jenks, 1; Prof. A. D. Bache, 1; Thomas B. Florence, M. C., 1: Dr. George B. Wood, 1; Smithsonian Institution, 1; Joseph Scattergood, 6; Charles Bullock, 1; The New York State Library, in exchange for our Journal, 19; Margaret Croussilat per Dr. Bridges, 8; American Academy of Arts and Sciences, Boston, Mass., 4; Prof. William Procter, Jr., 20; total 137 vols.

Which, together with 247 vols. reported last year, makes 384 vols. added by donation to our library in two years.

Your committee have also the pleasure of reporting a cash donation of $20, for the use of the library, from our fellow-member, Peter Williamson.

Signed, SAMUEL F. TROTH,
WM. PROCTER, JR.,
EDWARD PARRISH,
SAMUEL N. JAMES,
SAMUEL S. GARRIGUES,
Committee on Library.

The Committee on the Sinking Fund made their Annual Report, of which the following is an abstract:

"Since the last annual meeting of the College, the Committee have paid off $450 balance of temporary loan for altering and repairing the College Hall, have borrowed $3,000 on mortgage, and by the aid of that sum, have paid off at par the irredeemable ground rent on our property, amounting to $3,750. This mortgage is all the debt of the College at at this time, instead of the heavy incumbrance by which the College was embarrassed when this Committee commenced its labors in 1844.

Signed, SAMUEL F. TROTH,
AMBROSE SMITH,
EDWARD PARRISH,
Committee."

The Committee on Latin Labels reported the condition of their concern the past year. They have issued no new pattern of labels, but are now printing a small edition of druggists' bronze labels from the old plates. The Report of the Committee, with the financial statement accompanying it, was accepted, and, on motion, the treasurer of the Committee was directed to pay into the hands of the Sinking Fund Committee a portion of the balance in hand.

The Publishing Committee reported as follows:

"The Journal has been regularly issued since the last Annual Meeting, and its pages have received the support of contributors from various sections in a manner quite encouraging to the Editor. The subscription list is well kept up, as shown by reference to the accompanying report of its financial condition. The Committee believe that the Journal is not as much known in Europe as it should be, chiefly from the fact that no effort has been made on our part to extend its circulation in that direction. The idea is at present under consideration to get it introduced to some extent by sending it gratuitously to scientific journals and individuals, so as to bring the numerous American contributions to Pharmaceutical science and skill to the knowledge of European Pharmaceutists. Some progress has been made in this work in Germany, but in England our Journal is hardly known.

Signed, Chas. Ellis,
William Procter, Jr.
Edward Parrish,
A. B. Taylor,
On behalf of Committee."

The Committee on the preliminary revision of the Pharmacopœia, made a full report, accompanied by their minutes and by an imperfect copy of the proposed revised Pharmacopœia. The following is an abstract of the report:

The Committee met on the 17th of May, 1859, at the College Hall, organized, adopted rules and a programme of the proposed labor. Prof. Procter acted as Chairman, and James T. Shinn was appointed permanent Secretary. To make the number of the Committee 12, and thus to secure an equal division in the sub-committees, F. L. John and John M. Maisch were elected additional members.

The sub-committees were appointed as follows:

No. 1.	No. 2.	No. 3.
Prof. Procter, Ch'n.	Edw. Parrish, Ch'n.	A. Smith, Ch'n.
A. B. Taylor,	C. Bullock,	W. H. Pile, M. D.
T. S. Wiegand,	Wm. R. Warner,	S. S. Garrigues,
J. T. Shinn,	J. M. Maisch,	F. L. John.

In the division of the labor of revision, each committee was allotted about an equal number of subjects, and directed to report upon a certain proportion at each stated monthly meeting of the general committee. Meetings of the committee were held on the 21st and 28th of June, on the 5th, 12th and 19th of July, on the 16th and 23d of August, 18th of October, 15th and 29th of November, and 20th of December 1859, and on the 17th, 24th and 31st of January, and the 21st and 28th of February, 1860. The first five of these meetings were devoted to the consideration of the preliminary notices and the officinal *list*. After the full consideration and discussion of the list and the adoption of numerous proposed changes, it was referred to a special committee consisting of J. M. Maisch, F. L. John,

S. S. Garrigues, A. Smith and W. Procter, Jr., who were instructed to determine by experiments various points in regard to specific gravities, saturating power, tests &c., and to make a correct copy of the whole list.

The following are the new substances added to the primary and secondary lists and omitted from the same, viz:

To Primary list:
Acidum Lacticum,
Phosphoricum,
Alcohol Amylicum,
Alcohol Fortior,
Aloe Capensis,
Ammoniæ Sulphas,
Aurantii Flores,
Belladonnæ Radix,
Cadmium,
Caffea,
Capsicum Frutescens,
Chiretta,
Gelseminum,
Glycerina,
Gossypii Radix,
Hydrastis Canadensis
Ignatia Amara,
Leptandra,
Lobelia Semen,
Manganii Oxidum,
Mastiche,
Oleum Adipis,
Lycopodium,
Niccolum,
Ol. Aurantii Flor.
Ol. Aurantii Cort.
Oleum Camphoræ,
Oleum Thymi,
Plumbi Oxidum Rubrum,
Potassæ Bichromas,
Potassæ Permanganas,
Saccharum Lactis,
Santonica,
Sodæ Hypophosphis,
Spiritus Lauri.
Vanilla,

To Secondary list:
Achillea,
Angelica Arch.
Baptisia,
Berberis,
Caulophyllum,
Corydalis,
Cypripedium,
Curcubita,
Epigea,
Euonymus,
Eupatorium Purp.
Myrica,
Rumex Crispus,
Scutellaria.

Omitted from Primary list:
Cinchona as a general term for Barks,
Icththyocolla,
Sulphur Lotum,
Spongia.

To list from the Preparations:
Ammoniæ Carb.
Soda Bicarb.
Chloroformum,
Oleum Succini.

Omitted from the Secondary list:
Castanea,
Contrayerva,
Rumex Britan.
Rumex Obtusif.
Wintera.

As soon as the whole of the *preparations* had been reported upon, and these reports amended and adopted in committee, it was resolved to refer all of them to a special committee, to revise the Phraseology and Nomenclature, and to correct incidental errors, so as to prepare the whole for the copyist. This important duty was intrusted to A. B. Taylor, A. Smith and the Secretary.

The following is a list of the new preparations introduced, and of the formulæ expunged:

New Preparations:
Acetum Lobeliæ,
Acetum Sanguinariæ,
Acidum Chromicum,
Acidum Phosphoricum Dil.
Acidum Valerianicum,
Æther fortior,
Spiritus Chloroformi,
Aluminæ Sulphas,
Ammoniæ Phosphas,
Ammoniæ Valerianas,
Aqua Creasoti,
Aqua Aurantii Flores,
Atropia,
Atropiæ Sulphas,
Bismuthi Carbonas,
Cadmii Sulphas,
Calcis Phosphas Præcipitatus.
Ceratum Extracti Cantharidis,
Cinchoniæ Sulphas,
Emplastrum Arnicæ,
" Conii,
" Picis Canadensis,
" Plumbi fuscum,
Extractum Arnicæ,
" Digitalis,
" Colocynthidis,
" Senegæ,
" Valerianæ,
" Ignatiæ,
" Aconiti Radicis Fluidum.
" Buchu Fluidum.

Extractum Cimifugæ fluidum.
" Cinchonæ Fluidum.
" Conii Fluidum,
" Colchici Fluidum,
" Dulcamaræ,
" Ergotæ Fluidum,
" Gentianæ Fluidum.
" Geranii Fluidum,
" Glycyrrhizæ Fluidum,
" Hyoscyami Fluidum,
" Ipecacuanhæ Fluidum,
" Krameriæ Fluidum,
" Lobeliæ Fluidum,
" Pruni Virg. Fluidum,
" Podophylli Fluidum,
" Scillæ Fluidum,
" Serpentariæ Fluidum,
" Spigeliæ Fluidum,
" Taraxaci Fluidum,
" Uva Ursi Fluidium,
" Veratri Vir. Fluidum,
" Zingiberis Fluidum,
Liquor Chlorinii,
Liquor Ferri Tersulphatis,
Liquor Ferri Citratis,
Ferri et Aluminæ Sulphas,
" Ammoniæ Citras,
" Ammoniæ Tartras,
" Quiniæ Citras,
" Strychniæ Citras,
Ferri Sulphas Exsiccat.
Ferri Valerianas.
Oleum Tanaceti,
Oleum Erigeronis,
Pulvis Rhei Compositus,
Pulvis Sodæ Effervescentes,
Pulvis Aperientes Effervescentes,
Quiniæ Valerianas,
Resina Jalapæ,
Resina Podophylli,
Resina Scammonii,
Santoninum,
Liquor Sodæ,
Sodæ Chloras,
Sodæ Valerianas,
Spiritus Cinnamomi,
Spiritus Limonis,
Strychniæ Sulphas,
Syrupus Rosæ Gallicæ,
Syrupus Rubi Radicis,
Tinctura Arnicæ,
Tinctura Cannabis,
Tinct. Capsici et Myrrhæ,
" Cinchonæ Ferratæ,
" Ignatiæ,
" Opii Deodorata,
" Rhei Aromatica,
" Veratri Viridis,
Trochisci Cubebæ,
Trochisci Ferri Carbonatis,
Trochisci Zingiberis,
Unguentum Adipis,
Zinci Valerianas,

Preparations expunged:

Ferri Iodidum,
Pil. Ferri Iodidi,
Pil. Ferri Compos,
Pil. Galbani Comp.
Spongiæ Ustæ,
Tinct. Cinnam. Comp.
Tinct. Rhei et Gentianæ.

The great labor connected with this undertaking, from the very large number of experiments rendered necessary in the course of the revision, and the preparation of the numerous and elaborate reports of sub-committees and the final revision of these, has been gratuitously performed by the committee. It is now proposed to appropriate the funds at their disposal in procuring a complete and perfect copy of the whole for submission by the delegates from the College at the convention to meet in Washington in May next.

On motion the report was accepted and a bound copy of the Proceedings of the Committee directed to be placed in the Library of the College, as soon as the final revision is completed. The Committee is discharged, to take effect on the completion of the copy.

The Corresponding Secretary laid before the College a letter addressed by him to the Swiss Apothecaries' Association, in accordance with the instructions of the Board of Trustees, and in reply to the request of that Association for an interchange of dried specimens of plants between it and the American Pharmaceutical Association.

On motion of John M. Maisch, a Committee was appointed to collect an herbarium of indigenous plants, with reference to the exchange of specimens proposed, as follows:—J. M. Maisch, chairman, S. S. Garrigues, Wm. R. Warner, Thos. P. James and Professors Thomas, Bridges and Procter.

The Annual Election was now ordered, C. Shivers and S. S. Bunting acting as tellers. The College took a recess, after which the tellers reported the following election.

President,—CHARLES ELLIS.
1*st Vice President*,—Samuel F. Troth.
2*d Vice President*,—Dillwyn Parrish.
Treasurer,—Ambrose Smith.
Recording Secretary,—Edward Parrish.
Corresponding Secretary,—William Procter, Jr.

Trustees to fill the vacancies in the Board.

Dr. R. Bridges,
T. S. Weigand,
D. S. Jones,
S. S. Bunting,
J. C. Savery.
S. N. James,
T. M. Perot.
James T. Shinn.

Committee on Sinking Fund.

Samuel F. Troth,
Ambrose Smith,
Edward Parrish.

Publication Committee.

Charles Ellis,
A. B. Taylor,
William Procter. Jr.,
Dr. R. Bridges,
Edward Parrish.

Delegates to the American Pharmaceutical Association.

Wm. J. Jenks,
Wm. H. Squire.
Charles Shivers.
Wm. R. Warner,
John M. Maisch.

The meeting then adjourned.

EDWARD PARRISH, *Secretary.*

Editorial Department.

Annual Commencement of the Philadelphia College of Pharmacy.—The annual commencement of this College was held on the 11th of March, in the Musical Fund Hall, in the presence of the largest audience that has heretofore graced these occasions. The official list of graduates, twenty-nine in number, will be found in the College Minutes, at page 277. The Degree was conferred by Charles Ellis, President of the College, and the Valedictory Address was delivered by Prof. Robert P. Thomas, who pointed out the relations between the pharmaceutist and the community, and the powerful influence that an enlightened public opinion may have in the improvement and elevation of pharmacy,

Annual Commencement of the Maryland College of Pharmacy.—We quote the following account of the proceedings on this occasion from the Maryland Journal, viz:

"The annual commencement of the College took place on Thursday evening, March 1st, at Carroll Hall, corner of Baltimore and Calvert streets, and was attended by a large and appreciative audience. The following young gentlemen received the Diploma of the College, viz.:

John F. Hancock,	Subject of	Thesis,	*Cypripedium Parviflorum.*
John H. Bolton,	"	"	*Coptis Trifolia.*
John B. H. Jefferson,	"	"	*Hydrangea Arborescens.*
Samuel Fairbank,	"	"	*Chimaphila Umbellata.*
Gustavus Dohme,	"	"	*Polytrichum Juniperinum.*
John S. Conrad,	"	"	*Prinos Verticillatus.*

The exercises were opened with prayer by Rev. C. M. Roberts, M. D., followed by the announcement of graduates by Prof. I. J. Grahame. The degree of 'Graduate in Pharmacy' was conferred on the candidates by the President of the College, Mr. Geo. Wansey Andrews, and the Valedictory Address was delivered by Prof. Francis Donaldson.

The graduating class was larger than at any former period, and at the final examination all acquitted themselves with great credit. It affords us pleasure to say that the School of Pharmacy is in a flourishing condition, and the prospects of the College of a most flattering character. The annual course of lectures will commence about the first of November, of which due notice will be given by circular."

Resignation of Prof. Grahame.—We have known for some time past the intention of Prof. Grahame, of the Maryland College of Pharmacy, to retire from pharmaceutical pursuits, and devote his attention to another profession. This step will lose to the pharmaceutical body a highly useful co-laborer, and to the Maryland College one of its most valued teachers. We quote the following from the Maryland Journal for March:

> "In common with members of the College and Pharmaceutists in general, we regret deeply the withdrawal of Prof. Grahame from the chair of Pharmacy in the College, and his retirement from the active duties of Pharmaceutist in this city, to engage in another occupation in a neighboring State. Every community feels the loss of a useful member of society, but in the present instance the School of Pharmacy and the Pharmaceutists of the city have to part with one who has won the hearts of all by his urbane disposition, and whose place in the School of Pharmacy it will not be easy to supply.
>
> The best wishes of *all* go with Prof. Grahame to his new home, and although absent from our city, yet we hope the future pages of our Journal may be graced by the contributions of his pen."

The Druggist.—The last number of this Journal announces that the next will be issued under the auspices of C. Augustus Smith, of Cincinnati, as editor and proprietor. Being now solely under the management of Mr. Smith, he promises an able corps of colaborators, and we may look for many valuable contributions to the common stock of observations. So far, the "Druggist" has been creditably conducted, and the new editor has our best wishes for the successful issue of his new enterprise.

Cincinnati College of Pharmacy.—At a meeting of this Institution, held on Tuesday, the 8th of March, the following gentlemen were elected officers of the College:

President, W. J. M. Gordon,
Recording Secretary, William Snyder,
Corresponding Secretary, E. S. Wayne,
Treasurer, George A. Shuesler.

The Cavendish Society.—The Thirteenth Anniversary meeting of the Society was held at the rooms of the Chemical Society, Burlington House, London, on Thursday, March 1st, at 3 o'clock, P. M., Prof. Grahame presided.

From the Secretary's report, read on that occasion, we are informed that the 13th volume of Gmelin's Chemistry, after great delay, owing to the extensive additions that have been made to it, is nearly ready for distribution, and is likely to be the only book for 1859.

It seems now the determination of the Council to proceed with Gmelin's Chemistry as far as it can be obtained from the German editors, and complete the work, when, if deemed best, some reorganization of the Society can take place, or a new policy in regard to publications be adopted. The present income of the Society is not such as to admit of issuing two books annually. The Council have in view the publication of a general index for the Hand Book of Gmelin, which will, when the work is complete, be a valuable aid in consulting its pages. In answer to a question to that effect, the

Secretary announced that it would probably require three years more to complete Gmelin's Chemistry and the Index. The information is derived from the March number of the Chemical News.

MAISCH'S SCHOOL OF PRACTICAL CHEMISTRY AND PHARMACY.—The attention of our readers is called to the advertisement of Mr. John M. Maisch, in our advertising sheet. Mr. M., in devoting his time solely to scientific objects and teaching, is prepared to instruct young men in the details of chemical analysis and those of pharmaceutical manipulation. Pharmaceutists desirous of perfecting themselves in the practice of the more difficult processes of their art, and medical students who wish to acquaint themselves with the elements of pharmacy, in view of a country practice, will do well to avail themselves of the tuition of Mr. Maisch. Practical analyses, for commercial and medico-legal purposes, as well as of ores, minerals, etc., can be obtained by application to the laboratory, 800 Arch street, S. W. cor. Eighth st.

A Medico-Legal Treatise on Malpractice and Medical Evidence, comprising the elements of Medical Jurisprudence. By JOHN J. ELWELL, M. D., member of the Cleveland Bar. New York, John S. Voorhies, No. 20 Nassau Street; Cleveland, Alfred Elwell & Co., 1860.

It is not often that the author of a medico-legal treatise happens to be a member of both the professions to which its teachings are directed. The difficulties that constantly arise in the reception of medical testimony in our courts, owing to a mutual misunderstanding of the technicalities of the two professions, by which the lawyer is at fault in asking questions and the physician or chemist in answering them, so as to be most intelligible to the jury, make it very desirable that some well digested method of proceeding should be adopted, by which medical and chemical evidence can be couched in language easily understood by men of average common sense and judgment. For want of this method an ignorant witness may mistify a jury with absurd technicalities, or an unprincipled lawyer may impose on both judge and jury by marshalling forth an array of testimony, so nicely covered with scientific verbiage as to pass for weighty learning and stubborn facts. The chief novelty of the book of Dr. Elwell is the direction he gives it to surgical and medical malpractice, in both civil and criminal suits, including also the pharmaceutical bearing of the subject involving the responsibilities of druggists and apothecaries. This class of cases have not heretofore been digested into a regular treatise and were scattered through law books, rendering it a laborious work to consult them. The medical education of the author seems to have fitted him well for the task he has assumed. The increased frequency of civil suits for damages, for alleged malpractice.in surgery, medicine and pharmacy, renders it a matter of great importance that judges and lawyers should understand their cases, and be able to elicit and exhibit the testimony they involve, so that justice shall not suffer so monstrously as has frequently been the case by the inability of the legal advisers to satisfy the jury of the real nature of the wound or disease, and the true scope of the power of the surgeon and physician in effecting cures. Juries are too apt to lean in favor of the plaintiff—under a false idea of the powers of medicine, and an uncharitable view of the endless difficulties which beset the practitioner, *firstly* in diagnosis; *secondly* in judgment of treatment, and lastly, in the want of compliance with the directions of the physician by the attendents or the patients themselves. The frequency of cases requiring medical and chemical testimony arising out of suits for malpractice or criminal poisoning, suggests the importance of more special instruction and study in this branch of medical knowledge than is usually accorded either in medical schools or by medical men in their general reading.

Chapter xii., on the responsibilities of Druggists, although but brief, contains several suggestions relative to the legal responsibility of apothecaries and druggists which should be familiar to these classes.

" It is a well established principle of law, that a vender of provisions for domestic use is bound *to know* that they are sound and wholesome, at *his peril*. It is an equally elementary principle, that in contracts for the sale of provisions, the party, by implication, who sells them, undertakes to guarantee that they are sound and wholesome."

Blackstone also says: " Injuries effecting a man's health, or where, by any unwholesome practices of another, a man sustains any apparent damage in his vigor or constitution, as by selling him bad provisions or wine; by the exercise of a noisome trade, or by the neglect or unskilful management of a physician, surgeon, or apothecary, these are wrongs or injuries unaccompanied by force, for which there is a remedy in damages, by a special action on the case."

" These principles apply equally to druggists, physicians, and chemists, who compound medicines, as to those who sell bread meat and wines, etc. More care should be exercised by those who mix poisons for internal use, than is needed by those who sell fruit, food and the like. Bad wines, provisions, fruit and meat, can usually be at once detected by the senses; while the character of medical substances and compounds are only discovered by the careful analysis of an experienced chemist."

"A druggist, or one who prepares medicines, is held to a strict accountability in law, for any mistake he may make in compounding medicines. He must be exact in preparing those powerful medicines of which every small dose may produce fatal consequences. If an apprentice of an apothecary is guilty of negligence, he is guilty of manslaughter, if fatal consequences follow." When, however, instead of death, only damage to health results, then a civil action for damages against the employer for the act of his apprentice may be had.

" So, where a chemist makes a mistake when he is labelling medicines for the general market, if the medicine in the course of trade passes through many hands, and is finally bought and used by one who is injured thereby, the original maker is liable to the person so injured, and not the druggist, who, relying upon the correctness of the label innocently sells the article for what it is not."

In regard to the regulation of the sale of poisons the author quotes, approvingly, the circular issued by the American Pharmaceutical Association, at its meeting in Philadelphia in 1857, in regard to that subject. But two adjudicated cases in which apothecaries or druggists are involved, are brought forward, but these are sufficient to prove the unpleasant legal consequences that may follow errors, where the parties injured are venal and unscrupulous.

The subject of poisons and poisoning, is treated of in seven chapters. The author does not enter into the subject in much detail, confining himself chiefly to some leading cases in which arsenic and strychnia were employed with evil intent. He quotes the chemistry of these two poisons from "Taylor on Poisons," which perhaps at this time is the best treatise on that subject. Some excellent hints are given in regard to the conduct of professional witnesses, attention to which will save much trouble to them. especially to chemists, in regard to the details of receiving material for analysis, and in making every link of the chain of evidence complete. The testimony of Dr. Doremus, in the Stephens case, at New York, is highly complimented, and the clashing of chemical evidence in the Palmer strychnia case comes in for a share of criticism.

The author also calls attention to the want of provision in our State laws, for the employment and payment of competent chemists in these cases; for although in important instances these valuable aids to justice are called in, yet there is often a want of certainty about the payment of charges which renders the service among able chemists an undesirable engagement. Until our courts provide more liberally for this disagreeable and valuable service, the cause of justice will be liable to suffer. Dr. Elwell's book must be looked upon as a valuable addition to medico-legal literature, and although more especially addressed to medical men and lawyers, we recommend its perusal to every apothecary who inclines to accomplish himself in his profession, and to enable himself to form a correct opinion in regard to the legal responsibilities to which the practice of pharmacy is liable.

Annual Address on the Events of the Year. Delivered by appointment, Feb 22d, 1860, *according to the By-Laws of the Philadelphia County Medical Society*, by Benjamin Horner Coates, at the legal cessation of the Presidency for the preceding year. Published by order of the Society. Collins, Printer, 1860, pp. 28.

The topics chosen by the learned author of this address are numerous; among them pharmacy and pharmaceutists have come in for a share. It would require more space than we have to spare, to comment upon, as they deserve, the extraordinary expressions of this singular production. When the president of the largest medical body in our midst feels at liberty to speak thus of men, who, to say the least, have made laudable efforts to raise their status during the last three decades, because some of their number are guilty of improper practices, and his language is "published by order," one cannot but feel surprised. "Two wrongs don't make a right," nor is the return of evil for evil the wise course; yet were a similar latitude of remark indulged in by the apothecaries, within the strict lines of truth, they could easily demonstrate that learning is not always accompanied by infallibility, nor is excessive professional pride the mark of true Hippocratic wisdom. But as there are some points in the Address which call for a candid reply, and that due justice may be done to the author, it is but right that those points should be quoted, we propose to return to the subject in a future number, when the space at command will enable us to do it.

NEW MEDICAL JOURNALS.—Since our last issue we have received numbers of the following new Journals:—

The Cincinnati Medical and Surgical News. Edited by A. H. Baker, M. D. (Monthly.)

Louisville Medical Journal. Edited by Thomas W. Colescott, M. D. (Monthly.)

The Kansas City Medical and Surgical Review. Edited by Drs. Maughs & Case. (Monthly.)

Journal of Rational Medicine, Cincinnati. Edited by Dr. C. H. Cleveland. (Monthly.)

Memoir on the Salubrity of the Isle of Pines. By Dr. Don José de la Luz. Hernandez, Havana.

OBITUARY.—Dr. CHARLES FRICKE, Professor of Materia Medica in the University of Maryland, and previously holding the same office in the Maryland College of Pharmacy, died, on the 25th of March, at his residence in Baltimore, of diptheria, after a short but painful illness, in the 37th year of his age. Dr. Frick was one of the most promising scientific men of his native city, Baltimore, and remarkable for his gentle and amiable manners, which rendered him beloved by all who knew him.

—— Professor JAMES P. ESPY, died at Cincinnati, on the 25th of January, in the 75th year of his age. Prof. Espy was a native of Pennsylvania, and taught school in Philadelphia for a series of years. He is chiefly known as a meteorologist, and for his theory of storms. For many years past he has held the position of meteorologist at the National Observatory, at Washington, a position he retained at the period of his demise.

THE

AMERICAN JOURNAL OF PHARMACY.

JULY, 1860.

NOTE UPON THE FECULA OF ALSTRŒMERIA.

By J. Carson, M. D.,

Professor of Materia Medica and Pharmacy in the University of Pennsylvania.

The genus Alstrœmeria as a source of edible fecula, employed for purposes of nutrition in certain portions of the world, has not been prominently noticed in any work on Pharmacology in the English language, although it has been alluded to in scientific works and treatises of foreign production, without, however, much importance being attached to it in an economical point of view. My attention has been directed towards this subject in consequence of having received a specimen of fecula from Dr. Ruschenberger, U. S. N., when on a cruise in the Independence in 1855 on the western coast of South America. It was accompanied by the plant in an immature condition, with the tuberous roots attached, and which at the time was surmised to be a species of Alstrœmeria. Since his return home he has received and submitted to me the flowers of this plant, confirming first impressions and enabling me to determine the species. In the present paper I shall endeavor to present all the information possessed in connection with the history of this variety of fecula. The specimen before me is labelled "*Talcahuano Arrow Root.*"

The genus Alstrœmeria belongs to the natural family AMARYLLIDACEÆ, Lindley, *Vegetable Kingdom;* a family which contains many interesting plants, different in properties and uses.

ALSTRŒMERIA. *Gen. char.*—Perianth corolla-like, superior, six-parted, subcampanulate, regular or sub-bilabiate, interior divisions narrower, the two basic subtubulose. Stamina six, inserted in the bottom of the perianth; filaments erect or declinate; anthers oval, erect. Ovary inferior, trilocular; ovula in each cell numerous, horizontal, anatropous. Style filiform in the direction of the stamina. Stigma trifid, lobes replicated. Capsule oblong or globose, triple six-ribbed, trilocular, locularly trivalved, or more rarely berry-like, indehiscent. Seeds numerous, subglobose, horizontal; testa membranaceous, rugose, raphe immersed in the umbilicus, and joining the tuberculiform apex of the chalaza. Embryo axillary, shorter by half than the carnose albumen.—*Endlicher. Genera Plantorum.*

The species of this genus are found in tropical America, or extra tropical Australia. They have fasciculate tuberous roots, with leafy stems, which may be erect, scandent or voluble, and umbellate terminal flowers.

A. peregrina, Ruiz and Pavon, Flor. Peruv. v. iii., p. 288. Bot. Mag. tab. 139. Jacquin. Collec. ii. fig. 6. Redoute Lil. t. 46.

Sp. Des.—Glabrous; leaves sessile, resupinate, linear lanceolate, carnose; umbel 2–6 flowered, involucrate; sepal leaves of the perianth obovate-cuneate, shortly acuminate, or oval; petals lanceolate, obliquely linear maculate.

This species has a somewhat large fasciculated root, the fascicles being oblong cylindrical, white, soft and very fibrous at their termination. Stems diverse, simple, more than two feet in height, cylindrical, thick and shining, angled. Peduncles much longer than the terminal leaves, shining, erect. Perianth two inches in length, handsome, divisions white, deeply colored purple rose in the centre, and greenish at the point. Stamens declinate, shorter than the perianth, filiments subulate, anthers oval, obscurely purple. Style shorter than the stamina, with three diverging stigmata. Capsule subglobose, obtusely acuminate, trigonous, trisulcate, pale colored. Seeds glabrous, yellow.

This species presents several varieties: 1. The squamous, having the leaves to disappear and be replaced by scales. 2. With white flowers. 3. White and uniflowered. 4. When terminating in two or three flowers. Almost all are common in Chili, and known as the *A. peregrina*, an orthography preferable to *pelegrina.*

The tubercles of the roots, as those of the *A. ligtu*, contain a nutritious fecula, to which has been given the name *Chuno.*

A. ligtu, Lam. Roem. Kunth. *A. ligta*, Ruiz & Pavon. *Hæmerocalis ligtu*, Feuillé. *A. Feuillæana*, Mey, in Reliq. Hoenk.

Sp. Des.—Stem glabrous, erect; leaves linear lanceolate, striate, spirally twisted; flowers reddish purple, umbellate, petals subconformable.

This plant is entirely glabrous, green or a little glaucous, the root fasciculated, filiform, with oblong cylindrical tubercles, soft and sweetish. The stem is erect, simple, cylindrical, a foot in height and perhaps more, green superiorly, white below, diminishing in thickness and losing the leaves—these are sessile, linear lanceolate, subacute, arranged spirally, channelled, of two inches more or less in length and three lines in breadth, of a bright green, the inferior shorter than those of the middle, those at base scarious. Umbel of from two to ten rays, which are one or rarely two-flowered, accompanied by an involucrum, with the divisions corresponding to the leaves, but narrower, shorter than the peduncle. Flowers an inch and a half in length, of a rose purple, with the divisions cuneiform, lanceolate, acuminate, the four interior narrower, the two superior marble-veined, or spotted. Capsule hexagonal, pale, the size of a small filbert. Seeds globose, yellowish.

This appears to be the plant which gives the true *Chuno*, the fecula which resides in the tubercles of the root. In Chili this fecula is used as a diet for the sick and those with weak stomachs. It is produced principally in the provinces of Cauguenos and Conception.—*Historia Fisica y Politica de Chili*, &c., by Claudio Gay, vol. vi. p. 84.

We are informed by Molina that the bulbs of the *A. ligtu* are eaten, and that bread is made from them; this is known as the *Lily of the Incas.* This second species is the one which has been submitted to us by Dr. Ruschenberger.

Ruiz and Pavon have specified the *A. tomentosa*, as affording bulbs eaten in Peru. From Tussac, *Flore des Antilles*, we learn that the *A. edulis* is used by the negroes, and the bulbs sold under the name of *Topinambours blancs.* They are eaten boiled, with salt or some form of sauce. It may be that Tussac's plant is one of the foregoing species.

The fecula which has been furnished under the name of *Talcahuano Arrow Root* is of a dull white color, a little lumpy, and having a slightly rough feel. It is destitute of odor, and has no marked flavor. The form of the granules is either irregularly circular, ovoid or irregularly ovoid, with an apparent rectilinear slit, one fourth the diameter, or varied so as to be triradiate from a central point.

We have not any idea that the fecula, to which in the present paper we have directed attention, will ever become an article of consumption in this or European countries; we have presented it to the public with the sole view of pointing out an additional source of supply not usually referred to in systematic treatises upon the Materia Medica. The article will therefore be interesting to those who desire to possess a fuller history of the feculas than has been given in such treatises.

ON OLEUM ARACHIS HYPOGÆÆ.

By Jonas Winter.

Nat. Order: *Leguminosæ.*
Genus: *Arachis*, Linn.
Species: *Arachis hypogæa*, Linn.

Annual; slightly hairy; branching from the root and diffusely spreading; 1 to 2 feet high; leaves equally pinnate, long petioled; leaflets in two pairs, obovate pinnately veined, nearly sessile; stipules lanceolate, entire, acuminate, adhering to the petiole for half their length; calyx two-lipped; corolla small, yellow; pod gibbous, torulose, veined, coriaceous, 1 to 3 seeded; length ½ to 1 inch. After flowering, the peduncles elongate and the pod buries itself in the ground, whence the specific name *hypogæa.*

According to Linnæus it is a native of Surinam, Brazil and Peru in South America. Lindley, in his Encyclopedia of plants, also refers it to South America, but thinks it may have been brought thither from Africa. Persoon regarded it as indigenous both in the East and West Indies. At all events it is extensively cultivated in tropical countries as well as in the southern part of the United States, and will even grow in this latitude. It seems to prefer a sandy soil, and in favorable localities is a very prolific bearer.

The plant above described yields what are known to us as *ground nuts* or *pea nuts.* These nuts contain besides emulsin and other matter, from 20 to 25 per cent. of a fixed oil. In the preparation of the oil, the nuts including the external shells which are necessary in order to prevent the mass from caking, are ground under heavy chasing stones, of about seven feet in diameter, and after remaining there for half an hour, the pulp is heated in order to facilitate the operation; the whole is then submitted to a pressure of about forty tons to the square inch, and yields the oil upon expression. The nuts are imported for the purpose, direct to this city, from Sierra Leone, Goree and Gambia, on the western coast of Africa. The Gambia nuts are of a superior quality, but as the other varieties yield quite as good an oil, they are used by the manufacturer in preference to the more expensive ones. In order to ascertain the exact proportion of oil contained in the nuts, one thousand grains deprived of the outer shells were bruised and exhausted with ether, and yielded 260 grains of oil, or in the proportion of 26 per cent.

Pea nut oil, known in commerce by the simple name of *nut oil*, is of a bright yellow color, rather darker than the oil of sweet almonds; it has a mild and not unpleasant taste, and the characteristic odor of the nuts. A portion of the nuts deprived of their cuticle, yielded an oil almost entirely colorless, but in no other respect superior to the commercial variety. The oil is soluble in all proportions in ether, chloroform and benzine, and is insoluble in alcohol and acetone. Nitric acid first blackens and then reddens it, and sulphuric acid, by acting upon the organic matter, thickens it and produces a deep red color. It has a specific gravity of 0·918 at 60° F. and placed in a mixture of salt and ice, it was found to thicken at 38°, and congeals into an imperfectly homogeneous mass at the freezing point of water. Heated to a temperature of 580° F. the mercury remains stationary for a short time, and then rises suddenly;

at 620° it gives off dense vapors which ignite spontaneously; if the vessel is removed from the fire and covered, the flame is extinguished; but on removing the cover, contact with the air again ignites it.

In order to ascertain the applicability of this oil to the purposes of the pharmaceutist, a number of experiments were made with it, some of which resulted very satisfactorily, and proved that in some respects it would be a valuable addition to Pharmacy.

As is generally known to be the case, the cerate of subacetate of lead, made according to the U. S. P., unless carefully protected from the air, soon undergoes a change, and becomes more or less rancid. With the view of obviating this difficulty, a cerate was made according to the officinal formula only substituting pea nut for olive oil; the resulting cerate is of rather softer consistence, and seems to keep better than when made with olive oil. A specimen on hand made several months ago, and exposed to the action of the air, retains the desirable color and consistence it originally possessed, and is in every respect quite as good as when first made. Experiments were also made by substituting this oil for the oil of sweet almonds in making cold cream, and for lard in simple cerate, and resulted in the production of ointments, equal in all respects to those made according to the officinal formula. It was observed that in all the preparations into which wax enters, the nut oil combined more readily with the wax, and was less liable to become lumpy than the oils generally used for this purpose.

The ointment of the nitrate of mercury, made from this oil instead of the neats-foot oil, and made according to the process of Mr. Joseph Laidley given in the Amer. Jour. of Pharm. (xxii. 119,) yielded an ointment of a beautiful yellow color, and rather harder than that made by the officinal process. Another experiment was made by replacing both the neats-foot oil and lard with pea-nut oil; the resulting ointment was of rather a lighter orange color than the other, and just about soft enough for use. Specimens of each of the above ointments kept on hand for some months have undergone no change, either in uniformity of color or consistence, and it is thought that this oil might be substituted with propriety in the officinal process, as it affords a superior preparation.

A number of efforts were made by the use of the nitrate of mercury, to discover adulterations of oil of sweet almonds, or olive oil with pea-nut oil. It was found that an ointment made from olive oil and lard became very hard, and entirely unfit for use, and almond oil and lard produced the same result. Ointments made from equal parts of olive and nut oils, and in the same proportions from almond and nut oils without lard, formed preparations of a dark green color, of a medium consistence and very lumpy. Finally, ointments were made respectively in the proportions of one part of nut oil to seven of almond oil; two parts to six, and three to five, when it was found that in proportion to the amount of almond oil present, the ointment was softer and of a deeper color until they reached equal parts; when the almond oil is in excess, the ointment becomes harder, darker, and very lumpy. Olive oil treated in the same manner indicated similar results, so that there would seem to be no difficulty in detecting the adulteration, if practiced to any considerable extent. As there are so many circumstances in the preparation of the ointment of the nitrate of mercury, which would modify the result, such for instance as the variation of temperature, the mode of manipulation, or the amount operated upon, what may have appeared as tests in this case may prove differently in more experienced hands. These experiments are not therefore offered as reliable tests, but are merely stated as results.

The olive oil directed in the officinal process for making lead plaster was replaced with nut oil, but did not result satisfactorily. It was found that while it seemed to combine readily with the litharge, and produce a uniform mass, it would not become of the proper degree of hardness. It was also found not to be a drying oil.

In the arts it has been found to answer admirably the purposes of lubrication, when the lighter kinds of machinery are used, and one manufacturer heard from, has found it to be quite as applicable to shafting; it is considered quite equal in this respect to the coal oil now in such general use for this purpose. It possesses the advantage over most other oils in being more limpid, and consequently less liable to gum up the machinery.

In the manufacture of wool it has also been found to be a desirable substitute for the oils used for that purpose, inasmuch as has been just stated, it is less gummy, and consequently more easily washed out when the wool is spun. For illuminating purposes it was found to answer admirably when burned in lamps that are provided with a draft by chimneys, giving a superior light and also being consumed less rapidly than sperm oil. In ordinary lamps the wick was found to crust slightly, but it gave a brilliant and clear light. It is said that in Cochin China it is extensively used instead of olive oil for the purposes of illumination.

From the experiments made with nut oil it is concluded that it will answer all the purposes in Pharmacy to which other oils are applied, except in the preparation of lead plaster; and as has been shown in some of the preparations, it would be a desirable substitute. As it can be obtained at about 90 cents per gallon, it is likely to be substituted for olive oil, and it would therefore be well for manufacturers who purchase olive oil for making lead plaster, to examine it first by boiling with litharge, as if adulterated with nut oil it will be found not to form a plaster of a sufficient degree of hardness.

ON THE SOURCE OF BALSAM OF PERU.

By J. Carson, M. D.

Prof. Wm. Procter:

Dear Sir,—I submit to your inspection a letter lately received from Dr. Charles Dorat, of La Union, Guatemala, and if you think proper to publish it in the American Journal of Pharmacy, it is at your service. To me it is interesting, as it more specifically designates the mode of obtaining the article known as *Peruvian Balsam*. From this it appears that the article, must at least partially be *empyreumatic;* and from being prepared by boiling, is modified in composition so as to be very different from a natural exudation. The communication agrees in the main with the paper published in the American Journal of Pharmacy, for 1851, page 133, from the London Pharmaceutical Journal, by Dr. Pereira. The specimen of the plant in flower, which has been sent to me, corresponds with the description given by Pereira, and I have not the least doubt of its being identical. My specimen differs in having flowers and not the fruit.

Dr. Pereira did not describe the flowers, as they were not present in his specimen; my own specimen with his would have completed the materials for a full description, and I much regret that such did not fall into his hands. With the view of giving completeness to the description, I shall present the characteristics as shown by careful examination.

The flowers spring from the scars of the young branches and from the axils of the leaves, in single, slightly curved racemes, six or seven inches in length. The peduncle virgate and very delicately pubescent. Florets pedicellate, with a small ovate bract at base; pedicels curving downwards, 4 or 5 lines in length, and minutely pubescent; they are placed irregularly upon the peduncle, somewhat clustered below. Calyx campanulate, ovoid, 2 lines in width, and 2 or 3 lines long, minutely pubescent, obscurely dotted; margin five-toothed, the teeth rounded, and the inferior a little broader; the toothed appearance less conspicuous as the flower advances. Corolla composed of five white petals, the four inferior lanceolate, nearly twice as long as the calyx, the fifth superior, very conspicuous, banner-like, and supported on a narrow claw the length of the calyx. Stamina ten, slightly exserted, inserted in the base of the calyx. Anthers elongated, pointed and sulcated, inclined. Germ oblong, on a curved pedicel. Stigma simple.

The leaves of this plant are similar to those described by Pereira, (see Am. Journ. Pharm. and Lond. Pharm. Journal.) The opinion was entertained in the first paper of Pereira, (Lond. Pharm. Jour. vol. x. No. 7, p. 234,) that his specimens corresponded to the plant described by Ruiz and figured by Lambert, under the name *Myroxylon Peruiferum*, Linn., now the *Myrospermum pubescens*, De Cand. From careful re-examination of the specimens, in his second paper he announced an alteration of his opinion, and surmises that the species is a new undescribed one, probably identical with the plant spoken of by Hernandez as cultivated by the Aztec kings of Mexico, and called Hoitzilaxitl.

As in the notice reprinted in the American Journal of Pharmacy, the botanical history of the drug was omitted, it may not be uninteresting in this connection, by way of record, to present a summary of it.

The first author referring to the source of Balsam of Peru was Monardes, who speaks of it as being the product of a tree in New Spain called *Xilo*, date 1565. The next writer upon the subject was Francisco Hernandez, who resided from 1593 to 1600 in Mexico and New Spain. He notices *four* balsam trees, one of which is the Hoitzilaxitl, and another found in the province of Tolu.

Linnæus appears not to have had a specimen, but the younger Linnæus received specimens of a plant said to yield Peruvian Balsam, from Mutis. This was called *Myroxylon Peruiferum*, and a description published in the *Supplementum Plantarum*. This specimen consisted of the leaf, flowers and fruit. A description was given by Sir James E. Smith, in *Rees' Cyclopædia*.

Jacquin published an account of a species which he called *Myrospermum frutescens*.

Lamarck described another species under the name of *Myrospermum pedicellatum*, (*Encyclop. Methodique*,) distinct from the plant of Mutis, which latter he regarded as identical with Jacquin's *M. frutescens*. The *M. pedicellatum* was collected by Joseph Jussieu.

Ruiz described his species in 1792 as called Quinquino in the "Kingdom of Peru." The paper was translated and published by Lambert in 1821, in his *Illustration of the Genus Cinchona*, &c., with a figure to which has been appended the Linnæan name *Myroxylon Peruiferum*.

In 1823 the sixth volume of the *Nova Genera et Species Plantarum* of Kunth, containing the results of Humboldt and Bonpland's explorations, appeared. The plant of Ruiz and Lambert is there designated as *M. pubescens*, and the name *M. Peruiferum* retained by him for the Linnæan plant, a view coincided in by De Candolle.

From the foregoing sketch, which has been condensed from Pereira's first paper, it is clear that there are described four plants pertaining to the genus Myrospermum or Myroxylon.

1. The Linnæan plant, sent by Mutis, and called *Myroxylon Peruiferum*.

2. The plant of Jacquin, designated as the *Myrospermum frutescens*.

3. The plant of Lamarck, sent by Jos. Jussieu, which he designated as *Myroxylon pedicellatum.*

4. The plant of Ruiz, called by Lambert the *Myroxylon Peruiferum.*

It is with reference to these plants that we are to determine whether the one now under consideration, and described by Pereirain his second paper, is a new species or not; and it may be proper, previously to discussing this question, to present the opinions of those who have examined the subject. With reference to the plants enumerated, Sir J. E. Smith regarded the Mutis-Linnæan plant as distinct from *M. frutescens*, Jacquin, and *M. pedicellatum*, Lamarck; according to him, therefore, it stood as an original species, and was fully entitled to be retained as such. Kunth, on the other hand, regarded it as distinct from the *M. frutescens*, but identical with the *M. pedicellatum*. De Candolle has taken the same ground.

Lambert supposed he was only presenting to the world the Mutis-Linnæan plant in a more extended and definite way. It is now clear that the *M. frutescens* is distinct from *Myroxylon Peruiferum*, Linn., from the *M. Peruiferum*, Lambert and Ruiz, and that it is different from the *M. pedicellatum* of Lamarck. With regard to the identity or otherwise of the *M. Peruiferum* Linn., and the *M. pedicellatum*, Lam., as assumed by Kunth and D. C., we shall not now open the discussion. The question then resolves itself into the identity of the Mutis-Linnæan and Lambert plants, and the agreement of Pereira's plant with one or both of these.

With regard to the identity of the two first, it has been stated that Kunth and De Candolle have regarded them as distinct, retaining the name *Myrospermum Peruiferum* for the Mutis-Linnæan plant, and giving to the Lambert and Ruiz plant the name *Myrospermum pubescens*, while with the first *M. pedicellatum* is given as a synonym, (D. C. Prodrom., vol. 2, p. 95.) The points of difference are, the branches and petioles of the latter are hairy, the leaflets being narrower, more oblong and more rarely cordiform at base, and the nerves and petioles all closely covered with red hair. Admitting that these are distinctions enough to separate the two species, and without going into the disquisition with respect to their being only varieties of the same plant, we are brought to the point of considering with which of them is the plant of Pereira identical, or is it a distinct species.

By Pereira's account, the specimen in the Linnæan Herbarium, in London, is imperfect. We know how that Herbarium was obtained, after the elder Linnæus' death, by Sir J. E. Smith, who states in his article that Mutis sent leaves, flowers and fruit, to the younger Linnæus, from which his description in the Supplement was made out and published in 1781. It is reasonable to suppose that Willdenow knew something about the plant of the Supplement. In his fourth edition of the Species Plantarum, 1799, there is given a more elaborate description of it than is usually found in his work, at the same time separating it from the *M. frutescens* and *M. pedicellatum*. It is as follows:

"Arbor pulcherima, costice læva crasso valde resinoso, ut omnes arboris partes. Folia alterna abrupte pinnata. Foliola *bijuga*, *subopposita*, petiolata, *ovalo-lanceolata, apice producto obtuso emarginato*, *integra*, *venosa*, *glaberrima*. Rachis per longitudinem inferioris paginæ folii currens *elevata pubescens*. Petiolus communis *teres pubescens*. Racemi axillares erecti secundi, foliis longiores *pedunculo teretiusculo pubescente*, floribus sparsis. *Bractea singulum* pedunculum suffulciens minima *ovata erecta concava*, nudo oculo tuberculum referens. Pedicilli erecti. Calyx campanulatus *viridi canescens*, cinctus extra orificium petalis antherisque albis, intra continens legumen viride, quod in flore singularem faciem repræsentat. Foliorum substantia plena punctis linearibus translucentibus resinosis, ut folia citri."

With this description before us, we think that Dr. Pereira's account of the plant in his possession, and the completion of this account from the specimen in our own, only form a more extensive and more minute detail of the characteristics exhibited by the same plant, and therefore the conclusion follows that we both have had submitted anew to us the Mutis-Linnæan plant, of which the specific name has not been disturbed, and which is now the *Myrospermum Peruiferum*, D. C.

Pereira informs us that the leaflets of the *M. Peruiferum*, Linn., are smaller than those of his own specimen; "in shape they are not very essentially different." From the drawing they were five in number, and the figure presented for the sake of comparison represents most of the leaflets in my specimen. This then affords no ground again for the creation of a new species. The idea has been suggested to some pharmacologists, that as the species described by the botanists mentioned were derived from different sections, both Central and South American, there must be diversity on this account. It does not appear that there is any force in this argument in connection with the botanical history, and we are coerced to fall back upon strictly scientific characteristics. Thus it has been alleged that Mutis explored the northern portion of the continent of South America, and his labors were mostly confined to that section. But Mutis was an indefatigable botanist, and "Director of the Botanical Expedition of the Kingdom of New Granada," at Bogota, sufficiently close to the country of the Balsam trees to procure specimens and information through numerous agents and pupils. There is no reason as yet given us why the *M. Peruiferum* is not found in New Granada, although the Balsam of Peru is not an article of production. In fact, if M. Weddell found the same plant, i. e., the *M. Peruiferum*, Kunth, in Bolivia, as stated by Guibourt, the geographical difficulty is removed.

From the foregoing observations we have arrived at the following conclusions:

1. That Pereira's plant and our own are identical.
2. That this plant is the *Myroxylon Peruiferum* of Linnæus.
3. That it is the *Myrospermum Peruiferum* of Kunth and D. C.

There are some further points to be settled with respect to this interesting genus, involving the origin of the Balsam of Tolu.

Very truly yours, J. CARSON.

Philadelphia, June 12*th*, 1860.

OBSERVATIONS ON THE PRODUCTION OF BALSAM OF PERU. IN A LETTER TO DR. CARSON.

By Charles Dorat, M. D.

La Union, March 10*th*, 1860.

Dear Sir:—The difficulty attending a visit to the interior of the Balsam coast, and the extreme jealousy of the Indians towards all strangers seeking any kind of information concerning the products of their reserved lands, have prevented me, until the present time, from complying with your expressed desire to obtain specimens of the Balsam and Cinchona trees of this region. The *flowering season* of the former, in particular, being of very short duration, of scarcely more than a few days, it requires a residence of some time previous in the vicinity, to obtain the specimens. This year I succeeded, and am therefore enabled to send you the results, viz: a dried specimen and a colored drawing, made on the spot. It is of natural size, and intended for my journal, perfectly correct, although not highly finished. I also subjoin an extract from the same, including a few observations on the location of these trees, and on the mode of extracting the balsam.

These trees were formerly found in great numbers, covering the great inclined plain of Acajutla, as far west as the range of mountains on the frontier of Guatemala, but at present with very few solitary exceptions, are confined to the nearly uninhabited portion of the Pacific coast, between the new port of Acajutla and La Libertad. The medicinal virtues of the balsam were well known to the Indians before the conquest, and packed in earthenware jars, ornamented with the head of the *Pajuil* or wild Turkey, formed part of the tribute annually paid to the great chiefs of Cuscatlan, the present San Salvador. Its repute in the healing of wounds continued during and after the conquest, increasing with the scarcity of the balsam, from the wasteful destruction of the trees on the plain, then occupied by the Spaniards, who cut down the trees and boiled the chips. This custom was afterwards prohibited.

According to a manuscript copy of a papal Bull, at present among the old records in Tzalco, Balsamo Negro was in such high estimation, that in 1562, Pio IV, and in 1571, Pio V, issued orders authorizing the clergy to use this precious balsam in the consecration of the "*Sagrada Crisma*," and pronounced it sacrilege to destroy or injure the trees producing it. Copies of these Bulls are, I am informed, still in existence among the archives of Guatemala.

The tree is handsome, rather widely branching below, diminishing at top, and about 50 feet high. The flowers, which are very odoriferous, appear in the latter part of September and beginning of October, at the extremities of the branches, generally in pairs, numerous on each stem, white and unequal, calyx of a pale, bluish green, and very glutinous, from exuding balsam. Leaves of a dark shining green. The fruit is almond-shaped, winged, and containing a white kernel, with much balsam.

A very superior balsam is sometimes collected from the flowers, but is very scarce, and never found in commerce. The tree produces after five years growth, and attains a great age. It prefers a dry and poor soil, but is never found above an altitude of one thousand feet. The aroma is perceived at a distance of more than 100 yards. The tree having attained the proper age, 5 or 6 years, the *coseche*, or collecting, begins with the dry season early in November. The bark, for some distance up, is well beaten on four sides with the back of an axe, or other blunt instrument, until it has separated from the woody part, but without injury or breaking. This requires great care. In performing this operation, four intermediate strips of bark are left untouched, so as not to destroy the vitality of the tree.

Several notches or cuts are now made in the portions of beaten bark, with a sharp *machite*, and fire is applied to the openings. The exuding balsam kindles and is allowed to burn for a certain time, and then extinguished.

The tree in this state is left for fifteen days, and carefully watched; after which time the balsam, which begins to run copiously, is received on cotton rags, stuffed into the cuts. When saturated, they are pressed and thrown into earthenware pots, with boiling water, on which the balsam soon floats like oil. It is occasionally skimmed off and thrown into clean jars, while fresh rags are added. The extraction from the tree is only made during four days of each week, that is, four coseches per month for each tree, and the average produce is from 3 to 5 pounds per week. As soon as the supply begins to fail, fresh cuts are made in the bark, fire again applied, and after the 15 days' rest, the extraction is resumed. In this manner the collecting continues until the first rains appear in April or May, when all *trabajo* or work ceases.

When thus prepared, the balsam is of a very dark brown color, dirty, and of the consistence of turpentine. It is cleared and cleaned on the spot, by settling and re-boiling, when the impure parts rise to the surface and are skimmed off. This impure part is sold for manufacturing an inferior tincture, used medicinally among the Indians.

The balsam in this state is purchased on the coast, at an average of from 3 to 4 *reals* per pound. It sometimes undergoes a second clearing, when it fetches a higher price as "refinado." When first cleaned it is of an amber color, which darkens on cooling; finally, after a few weeks, it becomes dark brown.

A good tree, with careful usage, will produce well for 30 years, after which it is allowed to remain 5 or 6 years at rest, or as the Indians say, to renew its strength. After this period it will again yield for several years.

The wood is very elastic, hard, close-grained and of a dark reddish brown and yellow color. It takes a good polish.

It has been asserted that there are two or three varieties of balsam trees on this coast; as far as the knowledge of the Indians and my own researches extend, such is not the case. Only the one species exists, the *Balsamo negro;* neither is the *B. blanco* found here, although the produce of the "*Cortés blanco*" may have been sold under that name. This produce is as highly esteemed throughout the country for its curative properties as the *B. negro*, but the *tree*, *flower* and *fruit* are entirely different. The balsamito is an alcoholic extract from the fresh and young seeds, when broken, and is really a valuable medicine, in use here as a tonic and stimulant.

An Aguardiente de Balsamo, made from the flowers, is sometimes prepared on the principal haciendas. It resembles a liqueur, and is very scarce and expensive.

The Indian Pueblos on the coast, that supply the market of

Sonsonate with *Balsamo negro*, are: *Juisnagua*, six leagues from Tzalco; *Tintepeque*, *Ticalapa*, *Chiltiapa*, *Falmique*, *Famanique* and *Cumasagua*, near La Libertad. These pueblos are about three leagues distance from each other, situated among dense forests of the finest woods, and not to be reached but with a willing Indian guide.

The first and the last of the above named pueblos being in the vicinity of the two ports of Acajutla and La Libertad, produce very little balsam, they are merely depots; the inhabitants purchasing the article from the interior, themselves holding contracts with the merchants of Sonsonate.

The medicinal properties of this tree are too well known to need a description. I may only remark, that the Indian *Curanderas* use both the bark and leaves for preparing stimulating drinks to be used after severe cases of the coast fever.

I have also the pleasure of forwarding you a drawing of an old balsam pot, from an Indian mound, on the coast near Juisnagua. The bird's head so curiously represented is that of the Pajuil, or Mexican Pheasant, regarded by most of our neighbors here as the wild Turkey.

My observations on the cinchona capalchi, etc., I will send you at the earliest opportunity, as I am still in want of a few dried specimens, and some reliable information on their former history.

In the vicinity of the volcano of San Salvador I found a few myrrh trees, of which I much wish your opinion; and on the edge of the water, as also on that of Tzalco, some curious plants, which I must leave for your superior classification.

My present collection consists of colored drawings of about 150 plants used medicinally among the natives of this country. The number of destructive insects that abound, the difficulty of transportation, and want of many conveniences for preparing dried specimens, led me to prefer the use of my pencil, an infinitely slower process, but advantageous in representing the color.

My object, if possible, is to procure subscribers to the entire work. It consists of an exact description of the different States of the Republic of Central America, geographical and commercial, Flora and Fauna, with illustrative drawings, in short, a real and useful guide to all who may visit its shores. The politics of the country, tremendous tiger-hunts, and the description of miraculous metallic arteries, and not veins, so often mentioned but as yet unseen, I have left, as a wide and open field to be again explored by those successful authors, whose works have shed so strange a brilliancy on this poor and unworthy country.

The medical Flora might be published separately and in numbers, thus allowing me time, means and opportunity of continuing the work from the rich funds of the altos of Guatemala and of Costa Rica. A residence of ten years, my profession, much intimacy with the clergy and principal people of the country, have afforded me many opportunities of information, unattainable by other means. To reduce this into useful form has been my object.

Having but few friends in the United States interested in such pursuits, I have presumed on your time and politeness, by these remarks on my own affairs.

With much respect, I remain, dear sir,

Yours truly,

CHARLES DORAT.

To Dr. J. Carson, Prof. Mat. Med. University of Pennsylvania.

N. B. The Pajuil and other birds are found in numbers on the balsam trees, feeding on the young and tender seeds. The wild hogs are also fond of them.

ON THE DETECTION OF CROTON OIL IN MIXTURES.

By JOHN M. MAISCH.

It may be sometimes of importance to prove in a fixed oil the presence of croton oil. Its peculiar effect upon the skin will show it wherever it occurs in a considerable proportion. There is, generally, little danger of mistaking for it other oils of similar properties; as, for instance, the sulphuretted oils of mustard, garlic, &c., which manifest themselves by their odor. Fixed oils, however, might contain a sulphuretted oil, with its odor masked by some other perfume, and in so small a proportion as to produce only after several applications a slight inflammation of the skin; croton oil might be present under similar circumstances, and the question would then occur, how are we to prove the presence of croton oil? We can readily prove the absence of sulphur, but this would not prove whether or not croton oil was contained therein, unless we were by distillation to remove all volatile matter from this mixture. Small quantities cannot be well analysed in this way, as the inflammation produced might be too slight; besides, this method would not be one easily executed.

In searching for a convenient and ready mode for proving in oily mixtures the presence of croton oil, I availed myself of the results of Dr. Thomas Schlippe's researches on croton oil, (Annalen d. Chem. und Pharm. cv.) who, without being able to discover the cathartic principle, found the rubefacient ingredient, *crotonol*, to be a resinous principle, which, together with other resins and free acids, is removed from the oil, by agitation with an alcoholic solution of caustic soda, and then separated by neutralizing the solution with hydrochloric acid. This mixture of various components of croton oil, possesses the property of reddening the skin in a high degree.

I have followed strictly these directions, sometimes substituting for the soda, caustic potassa, and sulphuric for hydrochloric acid, with the same good results. Experimenting, first with mixed oils, containing from $\frac{1}{8}$ to $\frac{1}{10}$ of croton oil, I afterwards operated with olive and almond oil, containing one drop to the ounce. The quantity of caustic potassa is regulated according to the amount of croton oil, or, if unknown, in accordance with the effect of the oil upon the skin. For oils insoluble in alcohol, I have used 85 per ct. alcohol, adding to it a sufficient amount of an alcoholic solution of caustic potassa, and agitating well; after separation had taken place, I removed the alcoholic liquid, and added to it an equal amount of water, and a sufficient quantity of sulphuric or muriatic acid. Soon an oily liquid rises to the surface, which,when applied upon the arm, produces in the course of three or four hours not only inflammation, but also the pustular eruption peculiar to the effects of croton oil. If the quantity was small, the acidulated liquid was shaken with strong ether, the ether evaporated, and the residue applied.

For castor oil, and in the presence of volatile oils, I have employed diluted alcohol, mixed with an alcoholic solution of potassa, and omitted the dilution of the decanted alcoholic liquid.

The results were equally satisfactory, and in this manner I have detected croton oil, in the so called castor oil capsules.

It appears to me possible that croton oil may in this manner be detected in the stomach of animals poisoned by it; but not having the leisure for further experiments at present, I shall have to defer this subject until some other time.

According to Dr. Schlippe, croton oil contains about 4 per cent. of crotonol, and it is therefore necessary to operate very carefully, and without wasting anything. One accustomed to work with small quantities, will not fail to detect it.

In conclusion, I will remark, that in pills and emulsions, croton oil is detected in precisely the same way; these preparations are first exhausted with ether, and the residue from the evaporation of the ether is employed.

Philadelphia, June, 1860.

NOTE ON BOWER'S GLYCERIN.

By T. S. Wiegand.

The steadily increasing demand for glycerin renders it extremely desirable that every improvement in its manufacture should be promptly noted, and this more particularly so when occurring in our own country; these considerations have induced me to call the attention of pharmaceutists and the drug trade generally, to the article prepared by Mr. Henry Bower, of Philadelphia, and offered for sale by many of the leading druggists; that those whose attention has not been called to the fact, that this make is in every particular, as far as a number of carefully conducted experiments went to show, an article fully equal to the celebrated make of Price, of London. The specific gravity of a sample examined was 1.25125, Price's being but 1.251, according to the experiments of Prof. Campbell Morfit. To ascertain its freedom from inorganic matter, tests were applied carefully, the entire absence of lime, iron, lead and copper was fully established, thus evidencing the care used in its preparation, while every effort to obtain any of the odorous fatty matters, which have heretofore prevented the American made glycerins coming into general use, was entirely unsuccessful.

It is a matter of congratulation, that we have at last an article which may be used for all purposes, even the most delicate, with entire satisfaction. The article is also cheaper than Price's.

ON LIQUOR FERRI PERACETATIS.

By William Procter, Jr.

A tincture of acetate of iron has long been known as an officinal of the Dublin Pharmacopœia, made by double decomposition, between alcoholic solutions of the ter-sulphate of iron and of acetate of potassa.

Recently Dr. W. R. Basham, of Westminster Hospital, London, in Lancet, Jan. 28th, 1860, has suggested a new form of acetate of iron, which he has found to answer remarkably in many cases where other preparations of iron have disagreed with the patient, or have excited disgust. This solution is made from the officinal tincture of the chloride of iron and solution of acetate of ammonia, and was brought to my notice by Dr. John F. Meigs, who has frequently prescribed it.

Take of Tinct. of chloride of iron, (U.S.P.) three fluid drachms.
Solution of acetate of ammonia, three fluid ounces.
Syrup of orange peel, (or other syrup) a fluid ounce.
Acetic acid, ten minims.

Mix.

Of this solution the dose is a dessert-spoonful three or four times a day.

The chemical affinities result in the formation of peracetate of iron, and muriate of ammonia, with an excess of acetate of ammonia. Its impression on the palate, though astringent, is but slightly ferruginous, and has none of the inky taste of the chloride. When made without the free acetic acid, the solution undergoes change much sooner than with it. The preparation has the deep ruby red color of a solution of acetate of iron, and has a tendency to change by keeping. To give greater permanancy, and a more agreeable taste, I have, after a variety of experiments, adopted the following formula as worthy of acceptance:

Liquor Ferri Peracetatis.

Take of Acetic acid, five fluid ounces.
Carbonate of ammonia, (pure,) a sufficient quantity.
Tincture of chloride of iron, (U.S.P.) four fluid ounces.
Curaçao, four fluid ounces.
Ginger Syrup, a pint.

Reserve a fluid drachm of the acetic acid, and saturate the remainder with the carbonate of ammonia, then add the acetic acid and tincture of chloride of iron, and mix them. Lastly, add the other ingredients.

This solution is about one-third stronger than the other solution, and may be given in the dose of a teaspoonful to a dessertspoonful, mixed with a little water, three times a day, for an adult, after meals.

The proportion of sesquioxide of iron contained in this solution, is three quarters of a grain to the teaspoonful, or six grains to the fluid ounce; a dessertspoonful is equal to 16 minims of the tincture of chloride of iron, as regards its iron strength. The curaçao cordial may be substituted by any other suitable flavoring, except such as contain astringents, which of course will blacken the preparation. A sweetened tincture of recent orange peel, slightly aromatised with canella and oil of coriander or caraway, may be used.

This preparation has proved to be a valuable tonic and diuretic. Dr. Basham recommends it very highly in renal dropsy. Dr. John F. Meigs has found it particularly serviceable in cases of children requiring a ferruginous tonic. The presence of the muriate of ammonia, no doubt, has a modifying influence, as well also as the small excess of acetate of ammonia. Dr. Keating has derived valuable diuretic effects from it in cases of albuminuria. In a case of dropsical effusion attendant on heart disease, with great debility, its tonic action was decidedly efficient, proving acceptable to the stomach when other preparations had occasioned disgust.

Philadelphia, June 25th, 1860.

NOTE ON JAPANESE WAX.

By the Editor.

All of our readers are not aware that considerable quantities of Japanese vegetable wax have been received in this country. At page 561, vol. 31, of this Journal, (last year,) an account of the source, and some of the properties of this substance may be found. It differs from beeswax in composition, but in aspect has a strongly marked resemblance. There can be but little doubt, in view of the present high price of beeswax, that this substance will be employed to adulterate it, and pharmaceutists should be watchful that they be not imposed on. The fusing point of the Japan wax now in this market, is about 120° Fahr. That of pure white wax also obtained in this market is 154–5° F. Equal quantities of the two were united by fusion, and the mixture had a fusing point of 140°. By strict attention to the fusing point, in a careful experiment, any considerable percentage of this wax can be detected. It is said to consist chiefly of palmitic acid and glycerin, but we have seen no recent facts in regard to its composition. It is also said to be saponifiable, with comparative readiness, with caustic alkalies, another means of distinguishing it from true wax.

But whilst we should guard against its use as an adulterating agent, it is quite proper to examine into its value as a substitute for wax in pharmacy. Its low price, not one half that of white wax, is an object, especially in our large hospitals, where large quantities of cerate are used. With a view to solve this question, we have prepared cerate with it, in the proportion of one part to two of lard; one to one and a half of lard; and equal parts; and are having them practically tested as regards their consistence and blandness, compared with officinal cerate, and will report in a future number.

ON SPECIES ST. GERMAIN.

By the Editor.

This compound of senna and aromatics is considerably used in Philadelphia, and perhaps elsewhere. The following receipt for it is found in Redwood's Supplement to the Pharmacopœia, translated for the Prussian Pharmacopœia.

Species Laxantes St. Germain. Species Prothea St. Germain.
St. Germain Laxative Powder.

Take of Senna leaves, exhausted with spirit, four ounces,
Elder flowers, two ounces and a half,
Fennel seed,
Anise seeds, of each an ounce and a quarter.

Well cut and bruise them, and mix together, and when dispensing, add

Purified cream of tartar, six drachms.

The dose of this powder is 80 grains drank as an infusion.

The object of treating the senna with alcohol is to deprive it of odorous matter, and perhaps of some resinoid matter concerned in the production of griping. The spirit used should be alcohol (·835). When the tincture from a pound (7000 grains) of powdered senna is evaporated to an extract, it yields 1440 grs. which has a dark green color and strong odor of senna. Whether it possesses the purgative properties of senna to any extent, we do not know, but should doubt much its purgative value. On a recent occasion, a lady who habitually uses this preparation, and about to spend some time in Europe, was desirous to have it put up in the most convenient form. We suggested that a fine powder would be very convenient, as she could take her dose (of 20 grs.) in substance, stirred in a wine glassful of water, when it was not convenient to make the infusion. Another advantage of this form of the preparation is that it may be dispensed in bulk by the ounce or pound, as the ingredients are uniformly mixed. The patient soon acquires by practice a knowledge of the dose by measuring with a spoon.

DEATH FROM THE CARELESS USE OF A HAIR DYE.

By W. E. A. Aikin, M. D.

Prof. Chem. in University of Maryland.

Prof. Procter:

Dear Sir,—The subjoined extract from a letter received a few days since from a young medical friend in an adjoining State needs no preface. All names are withheld for the simple reason that my business concerns the wrong done without regard to the wrong doer.

"One of my neighbors lost a child a few days ago, supposed to have taken not exceeding f.ʒss. of the contents of the accompanying phial. If the mother be correct, I do not think the child could have taken more than a few drops. The child came into the room with the phial in one hand and the cork in the other and got up in the chair her mother had just left, was there unnoticed for a minute, and was then discovered in the act of falling, still grasping the phial. She was quite senseless and never moved afterwards, yet breathed (from their account) at long intervals for 15 or 20 minutes, when death relieved her sufferings. I gave 20 drops from the phial to a pup and it died in 5 minutes. I then gave f.ʒss. to a large cat and it died in one minute. The phial is supposed to be ———'s Hair Dye, as it is labelled precisely like that. There is a young man living in the family where the accident occurred who has the above Hair Dye, but he has only the phials marked Nos. 1. and 2. He says his phial No. 3 got broken long since. It seems to me that if a man were to put such an article in Hair Dye without cautioning the public, he would be liable to be punished, at least he ought to be. I will be obliged if you will examine the contents of the phial and let me know what the liquid contains."

The phial accompanying the letter was labelled No. 3, and contained a few drachms of a clear liquid, of a slightly yellowish tinge, a strong alkaline reaction, slightly ammoniacal, as shown when a glass rod moistened with hydrochloric acid was brought near it, and possessing the unmistakable odor of hydrocyanic acid, and having a specific gravity of 1.0525. One fluid drachm distilled with excess of dilute sulphuric acid and passing the vapor into a solution of nitrate of silver, gave me a precipitate of cyanide of silver weighing when dried grs. 10.30. A portion of this precipitate ignited in a small glass tube gave free cyanogen, which burned with its characteristic flame, and left a solid residue of metallic silver. A portion of the acid liquid left in the retort was then neutralized with a solution of pure soda, evaporated to dryness, ignited and re-dissolved; and in the solution thus obtained, bichloride of platinum and carbazotic acid both showed the presence of Potassa. It thus became evident that the phial had contained a solution of cyanide of kalium, a well known deadly poison, which, owing to its extensive use in certain electro-metallurgic operations, and other processes of the present day, that render it easily procurable, has been the frequent cause of death within a few years past. Since the one fluid drachm gave grs. 10.30 of cyanide of silver, the equivalent of cyanide of kalium would be grs. 4.99, which would represent the strength of the solution. But it occurred to me that a part of the cyanogen obtained might possibly have been supplied from cyanate of potassa, present either as an original impurity in the commercial cyanide, or as a spontaneous product from a solution of pure cyanide. Such solution it is well known becomes in part converted into the cyanate by exposure to air, and from this under certain circumstances free ammonia would be liberated. Prof. Graham suggests as a simple means for determining the purity of cyanide of kalium, to note its solvent power for peroxide of mercury, stating that grs. 12 of the pure cyanide in solution will dissolve exactly grs. 20 of the peroxide. By agitating f.ʒj. of the liquid with an excess of finely pulverized peroxide of mercury, I found that it would dissolve exactly grs. 7, and this according to the formula of Prof. Graham would represent grs. 4.20 of pure cyanide. The difference between grs. 4.20 thus obtained and grs. 4.99 as deduced from the weight of the cyanide of silver product, might thus represent the cyanate of potassa accidentally present.

I now made a solution of the commercial cyanide of kalium in the proportion of grs. 5 to one fluid drachm. This solution had a specific gravity of 1·050, showed the usual alkaline reaction, gave an appreciable quantity of free ammonia, and had its inseparable odor of hydrocyanic acid. And with the exception that it was more nearly limpid, agreed in all essentials with the contents of the phial under examination.

As there seemed to be room for reasonable doubt whether the party named by my friend as supplying the Hair Dye was really to blame, or whether one of his phials had been improperly employed to contain a poisonous solution, I thought it best to procure directly from the manufacturer through the agency of

Adam's Express a box of the Hair Dye in question. The box contained three phials labelled Nos. 1, 2 and 3, with printed directions for use. No. 3 of the box was exactly like No. 3 sent to me; in shape and size and label, and in its contents, being a solution of cyanide of kalium. No. 1 contained an alkaline sulphide, principally, if not wholly, sulphide of ammonium, with its disagreeable odor in good part concealed, apparently by rose water. No. 2 contained a mixed solution of the ammoniacal oxides of silver and copper. These two phials produce the dye. No. 3, as I had suspected, was needed for its solvent power, to remove any accidental stain on the skin made by the dye, and professed to be supplied for that purpose alone. A few drops from Nos. 1 and 2 mingled in a test tube with water gave at once a dark precipitate of the mingled sulphides of silver and copper. This precipitate was promptly dissolved on adding a few drops from phial No. 3, and quite as promptly disappeared when acted on by my solution of cyanide of kalium.

The character of the solution in the phial sent to me, the No. 3 of the Hair Dye, and its fitness for the purpose for which it is intended, is thus sufficiently apparent. Whether the proprietor of the preparation is excusable in supplying the public with such a deadly poison, without a word of warning that might induce some little caution in keeping and using it, is a question for the public and the authorities to decide. The party must have been aware, or should have been, that this compound, so harmless when used in accordance with the directions, if taken internally becomes one of the most rapidly fatal poisons known; scarcely inferior in this respect to hydrocyanic acid itself, and like that so rapid and so virulent in its action as to be almost beyond the reach of antidotes. It can be no consolation to the parents, whose little one has perished so suddenly and so horribly, to be told that the one who furnished the deadly draught never intended it to be used in that way, and I cannot help concluding with my friend that any one who could be guilty of such carelessness, if not liable to be punished, at least ought to be.

Respectfully, &c.,

William E. A. Aikin, M.D.

University of Maryland, Baltimore, June 26th, 1860.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

Herring Pickle.—Messrs. Girardin and Marchand (*Journa de Pharm., Feb.* 1860) describe the employment of herring pickle as a manure in agriculture. After describing the process of curing herring on the north and west coasts of France, they thus describe the liquid in question:

Herring pickle is a reddish liquid, rendered turbid by various organic matters, as blood, oil, etc., but when filtered it has a deep amber color. Our authors have, during the past five years, made several analyses of the crude pickle as used for manuring land, and having a density varying from 20° to 25° Beaumé. The following is the mean of several analyses of a litre (1000 gramme measures) of pickle:

Chloride of Sodium,	255·11	grammes.
Sulphate of Soda,	5·73	“
Phosphate of Lime,	0·98	“
Ammonio-magnesian Phosphate,	traces.	
Phosphate of Ammonia,	1·92	“
Phosphate of Propylamin,	3·53	“
Lactate of Ammonia,	5·76	“
Lactate of Propylamin,	10·79	“
Albumen,	1·90	“
Soluble organic matter,	15·10	“
Insoluble organic matter,	17·36	“
	318·18	

Propylamin (C^6H^9N), or its isomere *trimethylamin*, exists normally in herring pickle. Its presence was first stated by M. Wertheim, and we have confirmed his researches. In an experiment on a large scale we find that 100 parts of the dry matter obtained by neutralizing with chlorohydric acid, the volatile alkalies which are disengaged from it under the influence of potassa or lime consist of

Chlorohydrate of Ammonia,	30·23	parts,
Chlorohydrate of Propylamin,	69·77	“

We find the aqueous solution of propylamin to possess the following properties. It is very alkaline, and exhales a strong ammoniacal odor, recalling that of herring pickle. It precipitates the salts of alumina, but an excess dissolves the precipitate. It yields with the salts of copper a liquid of sky-blue color. Neutralized with chlorohydric acid and properly evaporated, it yields very deliquescent crystals, soluble in absolute alcohol when they are perfectly dry. Chlorohydrate of propylamin combines with chloride of platinum and forms a double salt, which can be isolated in transparent octohedral crystals of a beautiful orange red color, and preserving a persistent odor of herring pickle. Finally, sulphate of propylamin and sulphate of alumina unite to form an *alum* like ammoniacal alum, but which is deliquescent.

In the recent pickle, the authors found creatin, inosite and a body analogous to glucose, whilst in the old and fermented pickle butyric acid was a constituent.

Syrup of Iodohydrargyrate of Iodide of Iron.—M. Chamoun (Répert. de Pharm. May, 1860) suggests the union of iodide of iron and biniodide of mercury in the forms of syrup and pill.

Take of	Biniodide of Mercury,	1 grain,
	Syrup of Iodide of Iron,	3000 grains,

Triturate the biniodide with a portion of the syrup until dissolved, and incorporate it with the remainder. There appears to be a combination between the two iodides.

The new Belgian Pharmacopœia.—The following, from the Répertoire de Pharmacie, for April, is a transcript from the introduction to the new Belgian Pharmacopœia. It will be observed that the French decimal weights have been adopted, and that the shops of apothecaries are to be inspected.

A royal decree, dated Dec. 28, 1860, declares, Art. 1st, that the Pharmacopœia compiled by order of the government, and published under the title of *Pharmacopœia Belgica Nova*, is approved. Its Latin text only is official.

Art. 2. No copy of the new Pharmacopœia shall be issued without being furnished with the stamp of the minister of the interior, and the countersign of the inspector general of the civil medical service.

Art. 3. All persons who are authorized to sell medicines ought to have, 1st, a copy of the official Pharmacopœia.

2d, hydrometers for measuring the density of liquids.

3d, a centesimal alcoholmetre.

4th, good balances and exact decimal weights which comprise the subdivisions of the gramme to the centigramme inclusive.

Art. 4. Physicians are required to use the decimal weights in their prescriptions, and to employ the names of the official Pharmacopœia to designate medicinal substances. If they desire that the remedy be otherwise prepared, they must give the formula in the prescription, or indicate the Pharmacopœia wherein it may be found.

Art. 5. The doses of medicines will be indicated exclusively in grammes and centigrammes.

Art. 6. Pharmaceutists in the execution of prescriptions, and in general for the sale and delivery of medicines, will use the decimal weights. If they receive prescriptions in which the old medicinal pound weight is used they are to consider the pound to be 360 grammes, the ounce 30 grammes, the drachm 375 grammes, the scruple 1·25 grammes, and the grain 5 centigrammes.

Art. 7. The vessels, boxes, etc., used to contain medicines, shall be inscribed with the official names of the substances they contain.

Art. 8. The shops, stores, depots or laboratories of pharmaceutists, and in general all those who sell and dispense medicines, will be visited by delegates from the Provincial Medical Commission at least once a year, and at undetermined periods, without previous notice. The delegates will examine all the stock which they find in the shops, storehouses, &c., and especially those medicines of which the inspection is most important. They will remove medicines which may be found bad or falsified or which have not been prepared in the right manner. If the proprietor desires, he can enter his protest.

Art. 9. The medical commissioners will report their minutes and other records in reference to the deficiencies, to the the public minister charged with conducting suits before the courts.

Decoloration of Syrup of Sesquichloride of iron.—M. Duroy, in the *Journal de Pharmacie* for May, 1860, states that a syrup made by mixing 10 parts of solution of sesquichloride of iron of 30° B. with 490 of simple syrup, gradually becomes decolorized; the iron salt is reduced to the state of protochloride, and grape sugar is formed, the syrup losing its power of coagulating albumen.

Method of assaying the Distilled Waters.—M. Duregazzi states that it is easy to distinguish between a distilled aromatic water, and one made extemporaneously, by the action of iodine. A weak solution of iodine in water is prepared, the strength of which is known, and this is added to a given measure of the waters till the iodine ceases to be decomposed. The following list gives the quantities of iodine required to decompose the oils in a fluid ounce of each of the following waters, viz:

Bitter almond water 0.11 gramme; anise 0.08; oranges 0.06; chamomile 0.13; cinnamon 0.03; fennel 0.16; juniper 0.20; lavender 0.09; cherry laurel 0.22; balm 0.06; simple mint 0.24; peppermint 0.18; parsley 0.01; rose 0.12; rue 0.04; sage 0.06; elder flowers 0.08; valerian 0.04.

On the fixed oil of the Pistacia nut (Pistacio lentiscus).—M. Leprieur, in the Journal de Pharmacie for April, describes the manner of preparing this oil in Algeria. About the end of the month of August or the beginning of September the Arab women collect the berries by removing the branches and beating them with a stick. Each person can collect daily about 20 litres, which will produce nearly five litres of oil. As soon as the harvest is gathered the berries are ground in mills and then heated in vessels of water. The oil rises to the surface and is skimmed off and congeals by cooling, the heating process being continued till the berries are exhausted. The oil of lentisque is deep green; it is entirely liquid at the temperature of 89° to 93° F.; below that degree it deposits a white crystalline fat which gradually increases till the whole of the oil solidifies. The taste of this oil is acrid, like the leaves of the plant. The solid part of the oil can be separated by a regulated temperature. The fluid oil retains the deep green color derived from the berries. The berries yield from 20 to 25 per cent. The Arabs use this oil in their diet, and also for illumination, and its price is from 20 to 40 centimes a litre.

MANGANESE FORMS WITH OXYGEN ONLY ONE ACID—THE MANGANIC ACID.

By M. T. L. Phipson.

After very long researches on the manganate and permanganate of potassa, I have discovered that the latter salt is nothing else than a *bimanganate of potassa*, $KO, (Mn\ O_3)\ 2$, corresponding to the bichromate and bisulphate (anhydrous) of the same base. All these salts are anhydrous, and crystallize in the form of the rhomboidal prism.

I have made twenty analyses of the salt actually known as permanganate of potassa. Although anhydrous, this salt attracts some moisture from the atmosphere, and dried at salt water bath heat gave 1.60 per cent. of water. This is not water of combination. It is necessary therefore to pulverize thoroughly, and dry the salt at 100°, centigrade, for several hours, before proceeding to the analysis; then on treating the compound the potassa and oxygen are found to have exactly the figures of the formula, $KO, (Mn\ O_3)\ 2$.

The bimanganate of potassa forms a solution of purple red color; when there is added to it an excess of potassa, it passes into the green manganate $KO, Mn\ O_3$.

The *bimanganate* of baryta is soluble; the *manganate* of baryta forms a violet precipitate. The *bimanganate* of *potassa* does not give a precipitate with the salts of baryta, whilst the manganate precipitates them violet.

A current of air deprived of carbonic acid does not decompose the manganate of potassa, but carbonic acid separates the potassa and transforms it into a bimanganate, $2KO, Mn\ O_3 + CO_2 = KO, CO_2 + KO, (Mn\ O_3)\ 2$.

The solution passes from green to red; all acids act the same upon manganate of potassa.

Manganic acid is that body which has up to the present time been called *permanganic acid.*

It is obtained from bimanganate of potassa or baryta. It is a very feeble acid, does not displace carbonic acid from the alkaline carbonates, but is, on the contrary, partially displaced in those combinations.—*Translated from Comptes Rendus, No* 14, 1860, *by Samuel P. Duffield, Ph. D.*

CAFFEIN AS AN ANTIDOTE TO THE POISONOUS EFFECTS OF OPIUM.

Prof. Henry Fraser Campbell, of Georgia, in the Southern Medical and Surgical Journal for May, 1860, publishes an article on this subject. After giving some account of Caffein, and the use of coffee as an excitant, he describes the patient as a young man 24 years old, who had, in a fit of mental depression, swallowed an ounce and a half of laudanum, nearly an hour before his visit, 8 P. M. Narcotism had proceeded so far that emetics could not be employed; the muscles were greatly relaxed, the tongue falling back in the mouth and tending to stop respiration, and respiration exceedingly feeble. Cold water was applied, to the head for a time, artificial respiration resorted to, and the stomach pump then vigorously applied. At 12 o'clock P. M. the case seemed more hopeless, respirations *but four to the minute.* Artificial respiration in a sitting posture was then resorted to, which seemed to have a temporary good effect. Dr. Campbell then thought of coffee, but the patient could not swallow, and he doubted the propriety of using the stomach tube in the then condition of the patient. Finding it difficult to get a strong infusion of coffee, the idea of employing caffein occurred, and having dissolved 20 grains in a quantity of infusion of coffee, it was administered as an injection by means of a syringe. In half an hour the respirations were eight per minute; an hour had not elapsed before he "*forcibly jerked his left arm from the assistant,*" and told them "to let him alone." The narcotism slowly passed off, and at ten o'clock next day, when Dr. Campbell called, the patient had left the hotel and gone home. Although the effects of the narcotism were apparent for several days, they soon wore off, and the patient entirely recovered. Dr. Campbell believes that the caffein in this case was largely concerned in the recovery, and points to that alkaloid as probably possessing valuable antidotal powers in cases of narcotic poisoning from this drug.

PREPARATION OF IODIDE OF ETHYL.

Lautemann (Annal. der Chem. u. Pharm.) introduces 500 grammes of iodine and as much absolute alcohol into a large tubulated retort, and then places it in a vessel of cold water. He now adds very slowly fragments of phosphorus previously washed with alcohol. A lively effervescence accompanied with some elevation of temperature at first takes place, so that care must be taken not to add too much phosphorus at a time: but the reaction soon moderates, and enough phosphorus to make up 50 grammes can be added without inconvenience. The retort can now be adapted to the refrigerator, and placed over the fire. When the distilled product no longer becomes turbid in contact with water, it is shaken first with an alkaline solution and then with water; it is afterwards dehydrated by means of chloride of calcium and rectified.

The 500 grammes of iodine give from 562 to 574 grammes of hydriodic ether, that is from 91 to 93 per cent. Theory requires 614. The brown residuum in the retort is free from iodine.—*Chem. News, London, May* 5, 1860.

ACTION OF TANNIN ON ETHER AND WATER.

M. Luboldt (Journal für Praktische Chemie) says that tannin loses more or less water when heated on a bath of chloride of zinc according to the manner in which it has been prepared. When obtained by the method of Pelouze, it loses only 10 per cent. of water, but when evaporated from an aqueous solution it loses 12·85 per cent. Thus dried tannin gives up to *absolute* ether from 2 to 3 per cent. of fixed principles composed of a mixture of tannin, gallic acid, ellagic acids, and fatty and resinous substances. These relations are a little changed when water intervenes. At first anhydrous tannin has a great affinity for water, which it seizes upon and then dissolves in its own weight of ether, forming a syrupy liquid, which in the process of Pelouze constitutes the inferior layer. On this pure ether has no action, but if enough water be added, the tannin forms a viscous mass with the two liquids. The results varying according to the proportion of water employed, led the author to believe that they might be occasioned by the property which ether and water have of dissolving one in the other. He found in fact that the syrupy liquid only yielded $\frac{1}{50}$ its weight to water saturated with ether. The three layers obtained by treating tannin with ether and water according to the author are—1, the lower, ether dissolved in hydrate of tannic acid; 2, the second, the syrupy liquid of hydrate of tannic acid dissolved in etherated water; and 3, the same composition containing the fatty and resinous matter. —*Chem. News, London, March* 17, 1860.

ON THE PRESERVATION OF LEECHES.

By J. Mill Frodsham, M. D.,
Physican to the Farringdon Dispensary.

Hospitals and vendors have endeavored to derive advantage from leeches by making them serve several times, and especially by preserving them; yet I believe even now a leech is seldom employed twice, the mode adopted and recommended in all books for cleaning them after they have been used being generally fatal. When I was house-surgeon to the County Infirmary, Carlisle, I made numerous experiments to see how often and how long leeches could be employed and preserved without death; for this purpose a small glass vessel was used, in the bottom of which was placed about three inches of peaty earth, and twelve leeches, and then half filled with water, the mouth being secured with a coarse rag. These leeches lived in health for a year with only one or two deaths, many of them being employed twice in one day; but after being used, instead of putting them in salt, or vinegar and water, as usually done, they were placed for a few seconds in the camphor mixture of the Pharmacopœia, and afterwards washed in cold water, avoiding too much contact with the hand. But the apparatus *par excellence* for preserving leeches is the one introduced by M. Vayson, an eminent French breeder, and called by him the "Domestic Marsh." This consists simply of an earthenware vessel in the form of a truncated cone reversed, the lower extremity of which is pierced with a few holes sufficiently narrow not to allow the leech to pass through. This vessel is filled with turfy earth, the leeches are placed in it, and they soon instal themselves as well as they can; then the orifice is closed with a coarse cloth. If desired to be sent to a great distance the earth is wetted in all its thickness, and the vessel packed in a basket or box. If desired to preserve them on the same spot, the lower end of the vessel is placed in a tub, the water of which rises to about the height of four inches, and no further care is required. By the process of infiltration the lower strata of the "marsh" are soon wet through, the upper strata remaining dry; between these two extremes the leeches choose the zone most appropriate for them. M. de Quartrefages, by whom the above was brought before the French Academy, has kept and bred leeches in this way for two years with no deaths. This would lead us to believe that leeches do not live on the blood of animals, but on the infusoria.

The object of this communication is to recal attention to the fact that "*leeches* need *never be thrown away*;" and the hospitals and vendors may be induced to adopt this simple contrivance of M. Vayson, and thus make further experiments on the keeping and breeding of these very useful little creatures; for, as I have shown, they can be kept healthy and employed many times consecutively if properly treated.—*Lon. Pharm. Journ. May*, 1860.

KAMELA: (ROTTLERA TINCTORIA.)

Its History, Properties, Medical uses, Doses, &c.

History.—This plant was known to the Hindoos from the remotest antiquity, the fruit of which was employed by them as a remedy for worms, and also in certain skin diseases. They likewise used it for dying and printing silks, &c., but for this purpose it underwent a chemical process, viz., an alkaline solution was mixed with the powder of the fruit, which yielded a beautiful orange-brown color. But its properties have only recently been demonstrated by Drs. Anderson and Mackinnon, who first introduced it into England. Kamela belongs to the natural order *Euphorbiacea.* It grows abundantly on the hilly districts of India, Burmah, the Philippine Islands, and the north-east portions of Australia. Its fruit ripens in February and March, when it is gathered, and the powder, which appears as an excrescence, is carefully brushed off and preserved for use.

Properties.—The powder of Kamela is of a red brick color, with little or no odor and flavor, and like lycopodium it is difficultly miscible with water. Ether extracts a quantity of its resinous components, and if the solution be allowed to stand for a few days a precipitate of granular crystals is formed, which, when purified, is seen to consist of small scales of a yellowish color and satiny lustre, and named by Dr. Anderson, rottlerine. Alcohol extracts its medicinal constituents most perfectly, and the tincture made with rectified spirit is found to be very suitable for administration. Its formula on analysis is found to be C_{22}, H_{10}, O_6. Its composition is as follows:—

Resinous coloring matter . . .	78·19
Albuminous substances . . .	7·34
Cellulose, &c.	7·12
Carbon	3·86
Water	3·49
Volatile oil	A trace.
Volatile coloring matter . . .	A trace.
	100·00

MEDICAL USES.—Kamela has been successfully given in cases of tænia, and Dr. Mackinnon considers it of much greater value in those cases then either Kousso or Turpentine. Dr. Anderson describes "ninety-five cases of tænia, in ninety-three of which the worms were expelled after the third or fourth dose." It has been used also with very great success for tapeworm and ascarides by Dr. Arthur Leared, of the Great Northern Hospital, and by Dr. William Moore, of Dublin. The "Lancet," of May 15th, 1858, records six cases of cure of tapeworm by Dr. Ramskill, of the Royal Free Hospital. In some instances sickness, headache and purging are produced by it, but generally its adminstration is attended by no unpleasant result.

DOSE.—In powder the dose of this remedy is from one to three drachms early in a morning, fasting. The tincture* may be given in doses of from one to two drachms, night and morning, on lump sugar.—*Chemist and Druggist, London, March* 19, 1860.

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* Tincture of Kamela is made by macerating ½ lb. of powder of Kamela for 14 days in a pint of rectified spirits of wine.

FLUID EXTRACT OF LEPTANDRA.

Take of Leptandra root, in coarse powder,	1 pound,
Alcohol of sp. gr. 871°	q. s.

Moisten the powdered root with alcohol, and allow it to stand twelve hours; then pack it in a percolator, and pour on alcohol until the material is fully covered. Allow it to digest for forty-eight hours; then displace gradually, returning to the displacer the first runnings, until what passes is clear, adding, if necessary, more alcohol, until twelve ounces shall have passed. Setting this aside, cover the material with diluted alcohol, and continue the displacement until the root is entirely exhausted of its medicinal properties; evaporate in a vacuum to four fluid ounces, and mix with the twelve fluid ounces reserved, making one pint of fluid extract.

This gives a preparation of the strength of one ounce of crude material to one fluid ounce of extract; and as the dose of the powdered root is from twenty to sixty grains, that of the fluid extract will form one-third to one fluid drachm.

The form of a fluid extract allows of its ready combination with other fluid extracts, depending upon the purpose for which the combination is made.

Leptandra possesses valuable tonic, chologogue and laxative properties; is much employed in hepatic affections—and for this purpose is not unfrequently combined with the fluid extract of mandrake, in bilious and typhoid fevers, in dyspepsia and dysentery.—*Journ. of Mat. Med., April,* 1860.

ON PYROPHOSPHATE OF IRON.

By Mr. Robins.

Among all the elementary bodies, not one gives so large a number of beautiful and interesting preparations employed as remedial agents as iron; and were it not that the medical man has already so large a number at his command that he is somewhat perplexed in making a selection, the number might be increased almost *ad infinitum.*

One of the most recently introduced curative agents is (the so-called) pyrophosphate of iron, a salt more beautiful in appearance than the ammonio-citrate, or any other of the scaled salts before introduced. Its color varies according to the manufacture; may be made from a decided green to a greenish hue, yellow, or more or less of a reddish tint. Water dissolves it readily. In taste it has nothing to indicate its ferruginous character, but is rather that of a pleasant saline, so that the youngest children, or the most fastidious in palate of a larger growth, cannot object to its use. With regard to its efficacy as a tonic, when compared with other preparations of iron, that, of course, can only be decided by medical men.

The name given to the above is decidedly objectionable. The science of chemistry within the last few years has made such rapid progress that there is scarcely a day but some new compound is announced to the scientific world, some of which compounds have such long and formidable names that it requires more courage than many possess to attempt even to pronounce them; others are more simple, yet, from their immense number, but few memories can command them at pleasure. I think it, therefore, a pity when a new preparation is introduced of rather an indefinite composition to increase the necessary difficulties already existing by giving it the name of a definite chemical compound well known. The salt in question physically bears no relation to pyrophosphate of iron, and all that can be said chemically is, that the latter is one of its constituents.

Pyrophosphate, or bibasic phosphate of iron, is obtained by adding a solution of persulphate or perchloride of iron to a solution of bibasic or pyrophosphate of soda. A white precipitate is thrown down, quite insoluble in water and dilute acids. Pyrophosphate of soda is obtained by simply igniting to redness in a crucible the bibasic or ordinary phosphate of soda. The two are best distinguished by nitrate of silver, which gives with the former a white, and with the latter a yellow, precipitate.

Recently precipitated pyrophosphate of iron, obtained as above, is readily dissolved by pyrophosphate of soda and the alkaline citrates—viz. potash, soda, and ammonia.

When pyrophosphate of soda is used as the solvent, and the solution allowed to evaporate spontaneously in shallow vessels in a warm place, a nice-looking transparent salt is obtained, which however, is now nearly insoluble in water, evidently from some change that has taken place during desiccation.

Citrates of soda, potash, and ammonia dissolve freely pyrophosphate of iron, yielding salts readily dissolved by water; but the soda citrate I find to give the most satisfactory result. With it an elegant preparation may be made, easily scaled, readily dissolved by water, and which, when exposed to the air, retains its brilliancy for a much longer time than when prepared with citrate of potash or ammonia.

To prepare the citro-pyrophosphate of iron (perhaps the best name we can give it), take citrate of soda in solution, or dissolve citric acid and neutralize it with carbonate of soda, and, with the assistance of heat, dissolve in it as much recently precipitated pyrophosphate of iron as it will take up. Filter and evaporate to the consistence of a syrup. Lastly, spread on glass plates to dry, when beautiful scales of a greenish-yellow color will be obtained.

One part of dry citrate of soda is required to dissolve the pyrophosphate precipitated from one part of pyrophosphate of soda, free from water of crystallization.

As it may be considered desirable to introduce as much bibasic phosphoric acid into this preparation as possible, the following formula may be preferred:—

Take of Pyrophosphate of soda 1 part
Syrupy citrate of ammonia 1 part
Citrate of soda 2 parts.

Dissolve in it as much recently precipitated pyrophosphate of iron as possible, and proceed as before.

The salt formed by this process is also a very elegant one, having a greenish hue, and is perfectly soluble. If a reddish tint be desired, that can be easily attained by the smallest addition of ammonio-citrate of iron, after being reduced to a syrupy consistence.

One of the chief points of success in scaling the above preparations is to take care that the glass plates be not subjected to a heat much above summer temperature.—*London Pharm. Journ. April*, 1860.

FLUID EXTRACT OF POLYTRICHUM JUNIPERINUM.

By Gustavus Dohme.

Take of Polytrich. Juniper. in powder, . ℥viij.
Alcohol, ... q. s.
Diluted Alcohol q. s. (water 3 parts, alcohol 13 p.)

Mix the Polytrichum juniperinum in fine powder with 6 ounces of alcohol—pack it firmly in a percolator, and having placed over the surface a disk of cloth, gradually add alcohol until twelve ounces of tincture have passed; set it aside in a warm place till reduced to six ounces; continue the percolation with diluted alcohol (alcohol 13 parts, water 3 parts) until the liquid passes tasteless. Evaporate the tincture thus obtained over a water-bath to one ounce, adding to it one ounce of alcohol to redissolve the resinous matter, and mix with the concentrated reserved tincture, and filter if necessary.

As Polytrichum juniperinum is of a spongy, bulky nature, which makes tight packing for the process of percolation very difficult, I found it to answer a good purpose to first pack it with the hand as tight as possible; then place over it a perforated tin and a sufficient weight to allow the percolation to go on slowly. In following this precaution I was able to exhaust the mass with less menstruum than in percolating it without pressure.

The fluid extract made by the above process has a dark green color and strong odor characteristic of the herb and representing it, drachm for drachm.—*Journal and Trans. Md. Col. Pharm. June*, 1860.

AN IMPROVED FORMULA FOR AROMATIC SYRUP OF RHUBARB.

By Wm. S. Thompson.

Take of Rhubarb in coarse powder (No. 40) three ounces.
Cinnamon, in powder, (No. 50)
Cloves " " " of each half an ounce.
Nutmeg " " " two drachms.
Diluted Alcohol, . . a sufficient quantity.
Sugar, refined, . . . seven pounds.

Mix the cloves, cinnamon and nutmeg, moisten slightly with diluted alcohol and transfer to a glass funnel, having previously inserted a conical-shaped piece of sponge into the upper part of the neck. Displace until four fluid ounces have passed through, which reserve. Mix the rhubarb with an equal bulk of washed sand and the dregs of the aromatics; moisten slightly with diluted alcohol, transfer the whole to a displacer and add, gradually, diluted alcohol, until two pints have passed through, to which add half a pound of the sugar and evaporate in a water-bath to one pint. Make a syrup of the remainder of the sugar and two pints of water, add the evaporated tincture, boil for a few minutes, strain and add the reserved aromatic tincture while it is still hot. The syrup should stand at 30° Baume while boiling hot.

In following the process of the Pharmacopœia of 1850 for this syrup, a large amount of the volatile portion of the aromatic ingredients is lost by long continued heat in evaporation. By the process above recommended this objection is entirely obviated and the aroma uninjured. The object of adding a small portion of sugar to the tincture before evaporation is that it may act as a deoxidizing agent, and prevent the formation of apotheme. The amount of alcohol retained in the syrup, being only two fluid ounces in about seven pints, is too small to form a reasonable ground for objection. The syrup prepared as above, retains its transparency and contains all the aromatic droperties of the ingredients.—*Journ. Md. Col. Pharm.*

BORACIC ACID IN THE SEA-WATER OF THE PACIFIC ON THE COAST OF CALIFORNIA.

By John A. Veatch.

The existence of Boracic Acid in the sea-water of our coast was brought to my notice in July, 1857. I had, in the month of January of the previous year, discovered borate of soda and other borates in solution in the water of a mineral spring in Tehama county, near the upper end of the Sacramento Valley. Prosecuting the research, I found traces of Boracic Acid—in the form of borates—in nearly all the mineral springs with which the State of California abounds. This was especially the case in the coast mountains. Borate of soda was so abundant in one particular locality that enormous crystals of that salt were formed at the bottom of a shallow lake, or rather marsh, one or two hundred acres in extent. The crystals were hexahedral with beveled or replaced edges, and truncated angles; attaining the size, in some cases, of four inches in length by two in diameter, forming splendid and attractive specimens. In the same neighborhood, a cluster of small thermal springs were observed holding free boracic acid in solution. A few hundred yards from these, a great number of hot springs, of a temperature of 212° F., rose up hrough the fissures of a silicious rock. These springs held a considerable quantity of borax, as well as free boracic acid. Many other localities furnished similar indications, but in a less extensive form.

In progress of the examination I found that the common salt (chloride of sodium) exposed for sale in the San Francisco market, and which, it was understood, came from certain deposits of that article on the sea-margin in the southern part of the State, also furnished boracic acid. I was led to attribute it to the fact of mineral springs emptying into the lagoons furnishing the salt. It was, therefore, a matter of no small surprise, when on a visit to the localities, I found no trace of acid in any of the springs in the adjacent district. This led to an examination of the sea-water, and a detection of an appreciable quantity of boracic acid therein. It was at Santa Barbara where I first detected it, and subsequently at various points from San Diego to the Straits of Fuca. It seems to be in the form of borate of soda, and perhaps of lime. The quantity diminishes toward the north. It is barely perceptible in specimens of water brought from beyond Oregon, and seems to reach its maximum near San Diego.

This peculiarity seems to extend no great distance seaward. Water taken thirty or forty miles west of San Francisco gave no trace of acid. In twelve specimens taken at various points betwixt this port and the Sandwich Islands, furnished me by Mr. Gulich, of Honolulu, only that nearest our coast gave boracic acid. In ten specimens kindly furnished me by Dr. W. O. Ayers, taken up by Dr. J. D. B. Stillman, in a trip of one of the Pacific mail steamers from Panama to this place, no acid was discovered south of the Cortez Shoals.

I have not as yet been able to obtain specimens of water south of San Diego, nearer the shore than the usual route of the mail steamers. Neither have I been able to test the breadth of this boracic acid belt any further than the fact above stated, of no acid being found at the distance of thirty or forty miles west from the Golden Gate. I think it probable that it is confined within the submarine ridge running parallel with the coast, the southern portion of which is indicated by certain shoals and island groups. The source of the acid is undoubtedly volcanic, and the seat of the volcanic action is most likely to exist in this submerged mountain range. It strengthens the probability of the eruptive character of the Cortez Shoals.

I hope in future to be able to make more accurate and extended examinations, unless some one more capable of doing justice to the subject should take it in hand. With this view, I solicited the attention of Dr. J. S. Newberry to these facts while he was in this city, on his way to join Lieutenant Ives' Colorado Exploring Expedition, hoping he might think it worthy of investigation during his stay on this coast. With the same view, I now submit them to the Academy.—*Pacific Med. and Sur. Journ. April*, 1860, *from Proc. Cal. Acad. Nat. Sci.*

USE AND PROPERTIES OF PERCHLORIDE OF IRON.

The solution of this persalt is now almost universally employed to arrest arterial or venous hemorrhage, resulting either from accident, or as a consequence of surgical operations. It has also been found useful in intestinal hemorrhage ; in one case in particular. M. Demarquay, of Paris, administered, morning and evening, enemata of seven ounces of fluid, with twenty drops of the concentrated solution of perchloride of iron, and a teaspoonful of the perchloride syrup (five or six drops to the tablespoonful,) where the hemorrhage from the bowels was considerable, and had resisted the ordinary remedies. The result was extremely satisfactory. The same surgeon relates a second case of extensive abscess of the shoulder, where an injection of iodine caused severe hemorrhage. This was arrested by throwing into the sac a lotion composed of seven ounces of water and ten drops of the perchloride.

In gonorrhœa, and leucorrhœa, injections of the perchloride have been tried with success in weak and lymphatic subjects, the proportion of the perchloride being twenty drops to three ounces and a half of water.

As a *Hæmostatic.*—1. As a local or external hæmostatic, 3 to 5 parts chloride of iron to 100 parts of distilled water. Lint soaked in this mixture is to be applied with more or less pressure on the seat of hemorrhage. 2. As an internal hæmostatic, 1 part of chloride of iron to 500 of distilled water, sweetened to taste. One tablespoonful to be given every hour, or oftener, if necessary. This formula suffices to check the fiercest hemorrhage within twenty-four hours. The same formula, without sugar, forms a useful uterine injection or astringent lavement in cholera or colliquative diarrhœa. 3. A hæmostatic ointment is composed of 4 to 15 parts of chloride of iron to 30 of axunge.

In a letter in the *Medical Gazette*, August 27th, Mr. J. Zachariah Laurence states that having, a few months ago, drawn the attention of the profession to the powerful local styptic properties of the *solid* perchloride of iron, he has since that time found a superior method of employing it. "If the solid perchloride of iron be kept in a bottle, a small portion of it after a time deliquesces into a thick brown fluid, which is constantly kept in a state of super-saturation by the undeliquesced portions of the salt. This liquid, applied by means of a spun-glass brush to a bleeding surface, arrests the bleeding almost instantaneously. This mode of application is particularly valuable in applying the styptic to such cases as excision of the tonsils, bleeding from the deeper-seated gums, &c."—*Pharmaceutical Journal, Oct.*, 1859.

IMPROVEMENTS IN PREPARING RESINS.

By Hunt and Pochin.

This patent is partly for distilling turpentine *in vacuo*, and partly for an improved method of preparing "virgin resin." As the process is a valuable and important one, we shall give a condensed account of it. The principle consists, mainly, in filtering the crude turpentine (previous to distillation with steam *in vacuo*) at as low a temperature as is consistent with sufficient fluidity.

As the heat must not rise above 100° F. the material employed if not sufficiently fluid at that temperature must be thinned with spirits of turpentine until the requisite fluidity is secured. The materials are first strained through a coarse sieve of tinned copper, and then through a cloth sufficiently fine to retain all the impurities mechanically suspended in them. The filtered turpentine is then to be distilled in a current of steam *in vacuo*, until no more spirits of turpentine come over. The resin remaining in the still is almost colorless, and fit for employment in all cases which demand the use of virgin resin.

The practical simplicity and the commercial importance of the process developed in this patent are so obvious as to require no comment.—*Chem. News, London, May 12th*, 1860.

CHLORODYNE:

ITS HISTORY, PREPARATION, PROPERTIES, THERAPEUTIC EFFECTS, DOSES, &c.

HISTORY.—Chlorodyne was invented in the year '48 by Dr. Browne, whilst officiating in his medical capacity during the prevalence of cholera and diarrhœa amongst our troops in India, and was introduced to the notice of the faculty in this country by him as "a combination of perchloric acid with a new alkaloid."

PREPARATION.—From Dr. Ogden's analysis it appears to be composed as follows:—Chloroform, six drachms; tincture of capsicum, half a drachm; oil of peppermint, three drops; muriate of morphia, eight grains; perchloric acid, twenty drops; Steele's hydrocyanic acid, twelve drops; tincture of Indian hemp, one drachm; treacle, one drachm. Dissolve the morphia in the perchloric acid; then add the tincture of hemp, capsicum peppermint, and chloroform, and lastly, treacle and prussic acid.

PROPERTIES.—Chlorodyne is a volatile liquid possessing a pungent smell and taste. It is soluble in alcohol, but insoluble in water; but may be conveniently administered in that liquid by suspending it in a little mucilage. The alkalies and alkaline salts decompose it. In color it is dark brown, and in weight equal to twice its bulk of water. It is anodyne, sedative, diaphoretic, astringent, antispasmodic, diuretic, &c. Unlike the preparations of opium, it does not producche adache, giddiness, prostration of strength, nor stupor; but in large doses, and from a constipated state of the bowels, it is liable to produce nausea, which in the former case may be relieved by a small dose of sal volatile, and in the latter, by recourse to aperients.

THERAPEUTIC EFFECTS.—The changes produced by this preparation on the system are—first, a gentle heat at the stomach, followed by a general glow and total absence of pain; second, a calm and refreshing sleep; and third, an increase in the pulse from a "small, weak, thready, hurried, or bounding one, to a full, yielding, elastic, natural sort of one, decreasing in frequency of beats, as well as resistance, to a healthy condition."

Of it powers in the cure of consumption Dr. Stonehouse remarks:—"The cases (among others) in which I have employed it have been twelve cases of phthisis; eight of these patients had been examined by other medical men, and had been regarded as genuine cases of consumption, so that the nature of the disease does not rest upon my testimony alone. They were all well-marked cases; for I do not mention several others in an incipient stage. Two of the cases were in the last stage—*i.e.*, cavities had formed in the lungs; two others were bordering upon this stage. The remaining eight were in the second stage, that of softening: in five of these hæmoptysis was a prominent symptom. All these cases have done or are doing exceeding well. Five of them have quite recovered; the others, with one exception, are in a fair way towards recovery.

DOSES.—The dose of this preparation must be regulated according to the nature of the complaint. As an anodyne for febrile, inflammatory, or neuralgic affections the dose is from ten to thirty drops; diaphoretic in cases of coughs, colds, &c., ten to twenty drops; sedative in consumption, &c., twenty to fifty drops; antispasmodic in gout, rheumatism, &c., twenty to forty drops; astringent in cholera, diarrhœa, &c., fifty to one hundred drops. It is best administered on lump sugar, and given at intervals from every half hour to every four hours.—*Chemist and Druggist, Feb.* 15*th*, 1860.

PRODUCTS OF THE FERMENTATION OF MUCIC ACID.

M. Rigault observes (Comp. Rend. t. l. p. 782) that between citric and mucic acids there exist very remarkable relations: The two bodies have an almost identical composition, mucic acid having the same elements as citric acid, crystallised with two equivalents of water. Besides this, when submitted to the action of potash in a state of fusion, both are decomposed, and form 1 molecule of oxalic acid and 2 molecules of acetic acid, which seems to indicate that not only are their elements almost the same, but that they are similarly arranged. Personne has shown that under the influence of a ferment, citrate of lime is converted into acetate and butyrate of lime, which M. Rigault finds to be the case with mucate of lime. He fermented mucate of lime (using muscular flesh as the ferment), at a temperature varying from 25° to 35° C. The gases given off were carbonic acid and hydrogen, the proportion of the latter constantly varying. After six weeks the evaporated liquor, treated with sulphuric acid, yielded acetic and butyric acids, and perhaps a very small quantity of metacetic acid. Supposing the products of the metamorphosis of mucic acid to consist entirely of acetic and butyric acids, the reaction will be expressed by the following equation:

$$3(C_{12}H_{10}O_{16}) = 3(C_4H_4O_4) + C_8H_8O_4 + 16CO_2 + 10H.$$

The small proportion of butyric acid, however, and its late appearance among the products, induces the author to suppose that this is not an essential product, but the result of an accessory fermentation which goes on parallel with the principal phenomenon, and is determined by an altered portion of the ferment, and then the equation will be:

$$2(C_{12}H_{10}O_{16} = 4(C_4H_4O_4) + 8CO_2 + 4H.$$

The identity of the products of the fermentation of mucic and citric acids, justifies the opinion which attributes to these two bodies a simular molecular constitution, and strengthens the hope that citric acid may one day be obtained in the laboratory by a process analogous to that which gives mucic acid.—*Chem. News*, *London*, *May* 12*th*, 1860.

REMARKS ON TARAXACUM ROOT.

By Professor Bentley.

Professor Bentley said that he was very glad that the subject of Taraxacum Root, upon which several valuable papers had already appeared in the *Pharmaceutical Journal*, had been again introduced to the Members of the Society by a practical pharmaceutist; for when he reflected upon its enormous consumption, and the unsatisfactory state of our present knowledge in many particulars respecting it, he thought it was very desirable that those who had experimented upon it should make known the results of their investigations.

He then proceeded to remark upon the best time for collect-taraxacum root for use in medicine. He said he found that Mr. Hills, like other pharmaceutical chemists who had written upon it, had indicated the latter end of October, the month of November, and the commencement of December, as the best periods for its collection; but so far as his experience went, which had already been published in the Journal some years since, (see *Pharmaceutical Journal*, vol. xiv., p. 260), and which he had for the last seven years alluded to in his lectures, he believed that those were not the best months for the purpose. The reasons for thus collecting the root at the above times were—first, that its expressed juice was then richest in solid constituents, and thus yielded a larger amount of extract than at other periods; and secondly, the more uniform and pleasing appearance, and less deliquescent nature, of the extract then obtained. He then remarked that it was without doubt true, as shown by Mr. Squire and others, that dandelion root was in those months richest in solid constituents, but it by no means followed from this that it was at the same time in the most active state for medicinal use; for its value as a medicine most certainly did not depend solely upon the amount of solid constituents it contained, but principally, if not entirely, upon the presence of a bitter principle, which had been termed *taraxacine*. One of the best evidences, therefore, of the value of taraxacum and its fitness for medicinal use, would be its taste at different periods; and here he could speak positively, as he had repeatedly tasted it in the several months of the year, and had arrived at the following results—namely, that it was most bitter in the summer months, more especially in July; almost as bitter in the beginning of March, should the weather be then favorable for the season, and the preceding month had not been very frosty; much less so in October, November, and the commencement of December, and least bitter in the winter months, in fact, even sweetish in frosty weather or directly afterwards. The cause which produced the increased amount of the bitter principle in the root in the spring over that of the autumn he did not attempt to explain; it was, no doubt, due to some chemical changes in the contents of the root of which we were at present entirely ignorant. From the above facts alone it would appear that in the summer months the root possessed the greatest medicinal value, next to them in the early part of March, then in the autumn, and least in the winter months. Practically, there were several difficulties in obtaining a satisfactory result in a pharmaceutical point of view from the roots collected during the summer, and therefore he considered, taking every circumstance into consideration, that the end of February or beginning of March was, as a rule, the best time for collecting the root for medicinal use; or, should the season be very cold and the preceding months have been very frosty, then the time of collecting might be somewhat later. He was further convinced of the superior activity of the root at the above periods from being himself in the habit of taking the preparations of taraxacum as a medicine, and he had always noticed that those prepared in the spring were more active than those obtained at other periods. While thus referring to the medicinal properties of taraxacum root he could not but add his testimony to its value, its effects upon him being very decided and beneficial, and he had also seen the best results experienced by its use in others. He then said that he trusted that some Pharmaceutical Chemist would operate upon roots collected at the several periods mentioned above, and exhibit the results at a future meeting of the Society, and also at the same time place the different preparations in the hands of one or more hospital physicians in order that their activity might be properly tested. By such a course of proceeding we should soon come to a satisfactory conclusion as to the proper period for collecting taraxacum root for medicinal use.

While upon the subject of taraxacum, he said he should like to notice another circumstance connected with it, although not alluded to in the paper just read by Mr. Hills; he referred to the sweetish taste which the root possessed (as first noticed by Mr. Squire) after a frost, and which he had himself already referred to above. At present no explanation, so far as he was aware, had been given of the reason of this change of the taste of the root from its ordinary bitterness at other seasons. He had himself an opinion upon the subject which he would now lay before the meeting, but in the first place he must refer to changes of a somewhat analogous nature which had been observed in other plants and their parts under the influence of a frost. Thus, potatoes when frozen became sweet, which change was without doubt due to the conversion of their starch into sugar by the action of diastase. A similar conversion of starch into dextrin, and ultimately into sugar, he believed to take place frequently (much more so than was generally supposed), in the roots and other organs of plants during the winter months by the action of frost; hence the quantity of starch present in any particular plant or its several organs at a certain period would depend in a great degree upon the temperature to which it had been exposed. He said that there were many important conclusions arising from a knowledge of the above facts, but that was not the time to allude to them; he should therefore confine himself then solely to their application to the subject before them, as follows;—Taraxacum root contained a substance called inuline, which possessed several properties in common with starch, to which it must therefore be regarded as very closely allied in its nature. Now inuline was even more readily coverted into sugar than starch, and hence he believed an explanation was at once afforded of the sweetish taste acquired by taraxacum root after a frost—namely, the conversion of the inuline into sugar under the influence of frost in the same way as the starch of potatoes experienced a similar change under the like influence. That this was the true explanation of the change of taste in taraxacum root was further proved by its analysis at different periods of the year: thus, Overbeck found that the roots which had been collected in the spring contained but very little inuline, while one pound of the dried roots obtained in the autumn yielded two ounces and a quarter of that substance. Such a marked difference in the amount of inuline obtainable from taraxacum in the spring and autumn was at once readily explained if we believed in the conversion of inuline into sugar by the action of frosty weather. He also asked whether it was not probable that the deliquescent nature of the spring extract was also due to the same circumstance? In conclusion, he said that he thought his explanation of the production of the sweetish taste of taraxacum root by frost was a rational deduction from observed facts, but he now left the matter to those who were much better chemists than he was, either to admit his conclusions, or to show their fallacy, and at the same time to suggest a better explanation.

Mr. Hanbury remarked, that in a valuable paper read at a meeting of the Society by the Messrs. Smith, of Edinburgh, (*Pharm. Journ.*, vol. viii., p 480), they had shown that *mannite* was produced in taraxacum root. Could it be formed in any way from inuline? Mr. Hanbury also stated that he thought there would be practical difficulties in the way of collecting the root in March, as now suggested, even should it be proved to possess the greatest activity at that period.

Professor Bentley said it was quite true that the Messrs. Smith, as well as two German chemists, Widnmann and Frickhinger, had independently proved, that mannite did not pre-exist in taraxacum, but was subsequently produced in the infusion or juice of the root by a species of fermentation (called *lactic* or *viscous*) out of the sugar, and also, they believed, from the inuline and other hydrates of carbon which existed ready formed in the plant. He said he could see no practical difficulty in the way of collecting the root early in March, as the young leaves of the plant were then very evident, and possessed all the botanical characters of those in a mature state, and the plant could thus be readily found and distinguished from all others with which it was likely to be confounded.—*London Pharm. Journ. Feb.* 1860.

PREPARATIONS OF TARAXACUM.

By Mr. Thos. B. Groves.

[This paper was written some months ago, before the subject had been announced for treatment by Mr. Hills, or so ably commented upon by Professor Bentley; but was laid aside, under the impression that the subject had been sufficiently ventilated. It is now submitted to the meeting at the suggestion of some of the members, who consider that some of the points referred to will admit of further discussion.]

The dandelion plant is so well known and everywhere abundant, that it will be unnecessary to describe it here, nor need I repeat what is to be found in every Manual of Materia Medica, respecting the comparative value of its roots at various seasons of the year; suffice it that I have collected and prepared them at all seasons, and hold, that all things considered, October is the best month for treating them. The P. L. extract of dandelion is directed to be prepared from the root by macerating for twenty-four hours 2½ pounds of it bruised in two gallons of boiling distilled water, boiling the mixture to one gallon, straining while hot, and lastly, evaporating to a pilular consistence. The product I have obtained by this mode of procedure bears no similarity to any extract I have met with in commerce, and were it used without explanation would mortally offend nine of ten patients accustomed to the ordinary preparations.

I have found it to be an opaque mawkish mass, tenacious but not gummy, of saltish taste, but possessing little sweetness, and forming, when rubbed up with water, a whitish opaque fluid, as, I believe, very imperfectly representing the active principle of the root. The commercial extract, on the other hand, is of a more or less dark brown color, sweet in taste, with slight bitterness, tenacious and gummy, and forms, when diluted with water, a semi-transparent liquid. I here refer to extract sold as having been prepared according to the P. L. There are other extracts of a more pretentious kind, said to be obtained by evaporating the filtered expressed juice of the root, which are less sweet and transparent, but yet are very different from that I have been accustomed to obtain from the mere evaporations of the fresh expressed juice. This latter plan is that ordered by the U. S. Pharmacopœia. Pereira states of the P. L. extract, "that it should be brownish, not blackish. Its taste is bitter and aromatic; that of the shops is usually more or less sweet. It should be completely soluble in water." If by water is here meant cold water, the description is incorrect, according to my experience; though true if hot is intended; the fact of solubility then indicating that the liquor, previous to evaporation, had been properly strained from the inert tissue of the root and suspended albumen.

A reference to the published analyses of the root will enable us to account for the great differences observed in its preparation, and perhaps point out better modes of procedure. Royle, however, does not throw much light upon it. He says the juice contains sugar, gum, albumen, gluten, an odorous principle, extractive, and its peculiar bitter principle. This is not strictly true, or, at least, not the whole truth respecting either the milky juice, as observed to issue from the transversely-sliced root, or that obtained by pressing the bruised root.

Pereira goes into greater detail. The analysis of Frickhinger, which he quotes, gives as the constituents of the expressed juice, or the extract prepared with cold water, albumen, mannite, extractive, mucilage, sugar and salts; while that prepared by *boiling* the root in water contains, in addition, *inulin*. It is to the presence, absence, or modification of this last into gum or sugar, that the differences I have alluded to are attributable, and when I add that the expressed juice also contains inulin, as I have ascertained, though in a less proportion than the decoction, the same cause of difference operates also with the cold preparations, both of extract and liquor. As I before have stated, I usually operate on dandelion roots in October. I then find the roots, if the season has not been a very dry one, yield about half their weight of liquor, light brown in color, bitter, and more or less turbid—milky would scarcely be the right expression. This, when heated to coagulate albumen, I have strained and evaporated to a syrupy consistence, and then observed that a considerable quantity of matter had separated from solution. I have then strained, but found the same result shortly to re-occur, and, finally, that on allowing the again filtered extract to cool, it solidified to an opaque mass, of a somewhat gelatinous character, occasioned by the deposit of granules of inulin. It was therefore evident that these repeated filtrations were of no utility, as there would be no end to them, and accordingly the juice was evaporated after one straining only. I will here direct your attention to a mode of preserving extracts I have found very efficient in the case of extracts prone to mouldiness. I place such in covered pots, sprinkle the surface of the extract with spirit, and then hermetically seal them, by closely applying by the aid of heat a strip of adhesive plaster. Bladder, if sound, would have the same effect, but is liable to be perforated by insects; plaster is not.

The extract I should prefer would be that obtained by directly evaporating the expressed juice of roots gathered in October, after separating the albumen. It is of the utmost importance as regards uniformity, that a certain time should be specified for its preparation, and strictly adhered to. Much as the extracts prepared by different establishments differ among themselves, the liquors differ still more, and not unfrequently explanations have to be tendered as to why the medicine sent by you is so different in taste and appearance from that obtained elsewhere. Now, men conscientiously endeavoring to do their best, ought not to be laid open to these annoyances, from which the publication of an authorized formula would relieve them. The forthcoming Pharmacopœia will doubtless afford a remedy. I made the passing remark, the truth of which most present can certify to, that patients, as an almost invariable rule, firmly believe that the *first* time their medicine was dispensed it was dispensed correctly, and that any divergence from it marks an error: of the groundlessness of which opinion it is very difficult for one not backed by an "historic name" to convince them. Hence the necessity for authorized formulæ, and what is of at least equal importance, *sticking to them*, which all who regard their brethren's comfort should do, the comparative impurity of historic names notwithstanding.

There are three main ways of preparing the liquor: 1st, by adding rectified spirit to the expressed juice, without any previous preparation; 2d, by evaporating the juice to a certain extent and then adding the spirit; 3d, by redissolving the extract and adding rectified spirit to the solution. All these varieties may be obtained either bright or unfiltered from that the spirit has precipitated. A fourth kind is occasionally met with, prepared by percolating the dried root. It is the fashion to speak of the first and second when sold without previous filtration, as the "preserved milky juice of the fresh plant," &c.

To this I myself must in candor plead guilty, but the expression is likely to mislead. If it be supposed that this whitish flocculent liquid is at all similar to the milky juice that exudes spontaneously from the transversely cut root, nothing can be more erroneous. In the first place, it is not milky in the strict sense of the term; and secondly, it does not half so well represent the medicinal virtues of the plant. Pereira quotes the analysis by John of this milky juice, and finds caoutchouc, bitter matter, &c. It is, of course, to the former it owes its milkiness: to the latter its comparatively powerful medicinal effect. I have not found anywhere the proportion of caoutchouc, but should myself estimate it at not less than 25 per cent. of the dried, or, on the average, 8 per cent. of the fresh juice—a very considerable proportion. I have on more than one occasion found small lumps of nearly pure caoutchouc adhering to roots that had burst by lying in water a few hours. It will, perhaps, suggest to some individual to collect sufficient for a fair trial of its medical virtues when exhibited in pills. I have examined the expressed juice, and the sediment produced in it by rectified spirit, I find a portion of this sediment to be inulin, the remainder albumen, gum, &c.; in fact, matters of no value whatever. I will finally suggest a formula for the future preparation of a standard liquor—that prepared from the extract I dismiss at once. Collect the roots in the latter part of September or beginning of October; clean and thoroughly bruise them without unnecessary delay (though a few days lying in the dirt, as when taken from the ground, does not hurt them); express the juice, and should it not equal in weight the mark left in the press, add the quantity of water requisite for making up the amount, and after two hours again express, (this is to compensate for dry seasons, and thus conduce to uniformity); evaporate the juice to one-half, and when cold add to it one-fourth its volume of rectified spirit. Finally, filter, and cautiously express the residuum. I have tried less proportions of rectified spirit, but one-fourth has appeared to me to be the least that will effectually preserve it. I take the liberty of offering the Museum a specimen of inulin I have lately extracted from the taraxacum root, of which I believe the Museum is at present deficient. It was prepared from the root after the expression of the juice, as to have prepared it from the juice itself would have involved an unnecessary waste of material.—*London Pharm. Journ. May*, 1860.

ON THE FORMATION OF TARTARIC ACID FROM SUGAR OF MILK AND GUM.

By J. von Liebig.

When a mixture of one part of sugar of milk, two and a half parts of nitric acid, sp. gr. 1·32, and two and a half parts of water, is moderately heated, carbonic acid and gaseous products of the decomposition of nitric acid are disengaged, and there separates, after continuing the heat for some time, a thick white magma of mucic acid. Diluted with an equal volume of water, and filtered from the mucic acid, the liquid obtained yields a fresh portion of mucic acid on being again heated with one fourth of the nitric acid before employed. The whole of the mucic acid obtained amounts to about 33 per cent. of the sugar of milk. It follows that the greater part of the milk sugar must have escaped in the form of the gaseous products of oxidation, or be contained in the acid mother liquor, from which the mucic acid has been deposited. This liquid has a yellowish color, and when concentrated by evaporation yields a thick acid syrup, which frequently under 100° becomes at first brown and then black. When the mother liquor, from the mucic acid, and the washings are mixed and boiled, carbonic acid and nitric oxide are disengaged, and the liquid becomes dark brown; but this last effect may be prevented by the addition from time to time of more nitric acid. After continuing the boiling for 18 or 24 hours, the liquid no longer turns brown on neutralising with potash. At this time it contains a large proportion of tartaric acid. It is now concentrated by a gentle heat, and divided into two parts: one is saturated with potash, and the two are then poured together and allowed to stand, when crystals of bitartrate of potash are deposited. These are sometimes mixed with needle-like crystals of saccharate of potash, which, being more soluble than the bitartrate, may be easily separated by dissolving the two in as small a quantity of boiling water as possible, and quickly cooling the solution. In this way the bitartrate is separated in the form of shining crystalline granules. By standing longer, the mother liquor yields the fine needle-like crystals of the saccharate of potash.

Two analyses of the artificially formed bitartrate gave the following results:

	I.	II.	Calculation $C_8 H_5 KO_{12.}$
Potash . .	24·5	24·3	25·06
Tartaric acid .	75·5	75·7	74·94
	100·0	100·0	100·00

By adding nitrate of silver to the neutral potash salt, a white precipitate is thrown down, which quickly turns black in the light. On igniting the dry precipitate, 59 per cent. of metallic silver is left behind.

By neutralising the acid potash salt with soda, and slowly evaporating the solution, very beautifully formed crystals of Rochelle salt are obtained. After digesting the acid potash salt with antimonic oxide, well defined crystals of tartar emetic are deposited.

After these results, we can have no doubt of the formation of tartaric acid by the oxidation of milk sugar. It is also obtained when gum arabic is treated with nitric acid in the same way.

Besides mucic, saccharic, and tartaric acids, some oxalic acid is formed. The saccharic acid is in largest proportion immediately after the separation of the mucic acid; but by longer boiling with fresh additions of nitric acid it becomes decomposed, and the amount of tartaric acid in the residue increases.

A long illness has prevented Liebig from carrying out a series of experiments to decide the question whether the tartaric and saccharic acids are formed simultaneously, or first saccharic and then tartaric acid. He conjectures, however, that the latter is the fact—that the tartaric is formed from the saccharic acid.

From grape and cane sugar Liebig could not obtain tartaric acid, but as a small per centage of saccharic acid was formed from both, he believes the reason of his failure was the small quantities operated on.

On subtracting the formula of tartaric from that of saccharic acid, there remains a body with the composition of the carbohydrates :—

Saccharic acid	$C_{12}H_{10}O_{16}$
Tartaric acid	$C_8H_6O_{12}$
	$C_4H_4O_4$

The elements of the last subtracted from tartaric acid leave oxalic acid :—

Tartaric acid	$C_8H_6O_{12}$
Carbohydrates	$C_4H_4O_4$
Oxalic acid	$C_4H_2O_8$

Liebig believes that oxalic acid is the first acid product formed in a plant from carbonic acid, and that tartaric and malic acids are derived from oxalic. By exchanging two equivalents of oxygen for two of hydrogen, oxalic acid becomes malic ; by exchanging four of oxygen for four of hydrogen, it produces aldehyde. Malic acid therefore may be considered as oxalic acid half changed into aldehyde.

To become tartaric acid, malic acid has only to fix two equivalents of oxygen :—

Malic acid	$C_8H_6O_{10}$
Tartaric acid	$C_8H_6O_{12}$

Tartaric acid then is only a product of the oxidation of malic acid ; and this explains the constant presence of malic acid in unripe grapes.—*Chem. News, London, March* 31, 1860, *from Ann. der Chem. und Pharm.*

ON THE PREPARATION OF LARD.

Mr. Hills stated, that having been requested by Dr. Redwood to give his experience on the preparation of lard, he begged to make the following remarks :—

Having experienced great difficulty in obtaining lard perfectly fresh and free from smell, and having tried a variety of plans, such as getting it as a favor from wholesale houses, or inducing farmer friends to make it expressly, and also having it made on our own premises, none of which succeeded to my satisfaction, I at last thought of a plan of preparing it in the same manner as marrow is prepared for pomade, by separating all the membrane from the *omentum* (flare), then breaking up the fat in a mortar, and well washing it in water.

The plan adopted was as follows:—Get a large pan made of tinned iron, having a perforated diaphragm standing on four or five feet within two inches of the bottom, under which there is a hole about half an inch in diameter for the water to run away. Then place this pan in a sink, or some convenient place where a running stream of water can be applied, and having nearly filled the pan with water (first stopping the hole at the bottom with a cork), put in the broken up mass, and wash it by squeezing into thin layers in the water, keeping the water constantly running. After which it is set on a colander to drain, and then melted by means of a steam or water bath. It is then placed in jars for use. Great care should be taken not to allow a particle of water to remain in the prepared lard.

Benzoated lard may be prepared in the same way; throwing in the bruised gum benzoin, and allowing it to remain in contact about two hours.

Prepared lard (the *Adeps* of the London Pharmacopœia) made by the foregoing process is deprived of the peculiar fatty animal smell, is whiter than that usually found, and will keep longer.

Mr. Buckle said the process of washing the fat before melting it was new to him; he had usually done it after melting. He found it desirable to reject that part of the flare which immediately surrounded the kidneys and ureters, as this usually had a disagreeable odor; and if the separation of this was carefully attended to, he thought a perfectly good and odorless lard could be obtained by the usual process.

Mr. Wright recommended the process usually adopted by perfumers, which consisted in cutting up the flare, boiling it with water, and then adding a small quantity of alum, which caused the separation of some impurities.

Mr. Hills considered it important to remove all matter soluble in water before melting the fat, as otherwise these substances would impart a certain odor to the lard, and render it more liable to become rancid.—*London Pharm. Journ. Feb.* 1860.

THE SPECIFIC GRAVITY OF MIXTURES OF ALCOHOL AND WATER.

After three series of determinations which have occupied him more than a year, H. von Baumhauer has arrived at the conviction that the specific gravities of mixtures of alcohol and water as determined by Gilpin, Löwitz and Gay-Lussac, are very incorrect. In the first series of experiments the mixtures were made by volume, but as these gave results so different from those generally received, the author repeated his experiments with mixtures made by weight as well as by measure. These, however, only confirmed the results previously obtained. The author started with absolute alcohol having a sp. gr. of 0.7946 at 59° F. In the second series alcohol from another source was used which had the sp. gr. 0·7947 at the same temperature. The water used in the experiments was distilled and carefully deprived of air. After corrections for slight mistakes the results obtained were as follows:—

Alcohol in 100 of the mixture.	1st series.	2d series.
100	0·7939	0·7940
95	0·8119	0·8121
90	0·8283	0·8283
85	0·8438	0·8432
80	0·8576	0·8572
75	0·8708	0·8708
70	0·8837	0·8938
65	0·8959	0·8963
60	0·9079	0·9081
55	0·9193	0·9196
50	0·9301	0·9302
45	0·9394	0·9400
40	0·9485	0·9491
35	0·9567	0·9569
30	0·9635	0.9636
25	0·9692	0·9696
20	0·9746	0·9747
15	0·9799	0·9800
10	0·9855	0·9855
5	0·9919	0·9918
0	0·9991	0·9991

Chem. News, London, April 7, 1860, *from Comptes-Rendus.*

ON SOME FAILURES OF MARSH'S PROCESS FOR THE DETECTION OF ARSENIC.

At the last meeting of the British Association, Dr. Odling read a paper, which has been since published in *Guy's Hospital Reports*, showing that the presence of certain organic and saline substances prevents the formation of arseniuretted hydrogen, and consequently destroys the action of Marsh's test. The author had occasion to examine a soil which contained 0·07 of arsenious acid. Ready indication of the presence of the arsenic was obtained by Reinsch's process, but, most unexpectedly, when the dilute hydrochloric or sulphuric decoction was tested in Marsh's apparatus, no result could be obtained. Thus, 100 grains of the dried soil, boiled with half an ounce of muriatic acid and three ounces of water, yielded a solution in which no arsenic could be detected by Marsh's test, yet the liquid poured out of the apparatus and boiled with copper foil gave a metallic deposit from which crystals of arsenious acid were obtained. Another acid decoction prepared in the same manner, was distilled to dryness, and the distillate transferred to Marsh's apparatus, when characteristic stains were obtained with the greatest facility. Also, when the 100 grains of soil were heated with strong oil of vitriol, so as to thoroughly char the organic matter, then diluted with water, and the filtered solution tested by Marsh's process, a satisfactory reaction was obtained. One-fifteenth of a grain of arsenious acid was then added to ordinary non-arsenical soil, and precisely the same results obtained—that is to say, the simple dilute acid decoction gave no evidence with Marsh's test.

Two different specimens of grass that had been grown upon arsenical soil, and also some hay to which one fifth of a grain of arsenious acid had been added, were examined; the acid decoctions tested by Reinsch's process readily furnished arsenical deposits, but afforded no evidence in Marsh's apparatus. Two quantities of human stomach, each weighing two ounces, were boiled for an hour, one with dilute muriatic, the other with dilute sulphuric acid, and the decoctions filtered off and mixed with from a fourth to a third of their bulk of rectified spirit. To about three ounces of each decoction 0·01 of arsenious acid was added, and the liquids then tested in Marsh's apparatus, but no arsenical stains could be procured; whereas ordinarily the one-hundredth of a grain of arsenious acid in three ounces of dilute muriatic or sulphuric acid, affords characteristic arsenical stains with the greatest facility.

From these results it appears that Marsh's process cannot be relied upon to detect minute quantities of arsenic in the presence of organic matter, that is, under conditions in which it can be most satisfactorily detected by Reinsch's process. The plan recommended by Dr. Odling for extracting the arsenic from an animal tissue, in a state suitable for testing, is as follows:—About a quarter of a pound of the tissue, cut or broken up, is placed in a beaker glass with an ounce and a half of water, and half an ounce of muriatic acid. The beaker with its contents, covered by a glass plate, is then stood upon a sand bath, and maintained at an almost boiling temperature for half an hour. There is no fear of any arsenic being lost during this digestion, for even the first half of the distillate from such a liquid does not carry off a trace thereof, unless, indeed, a very large proportion be present. The decoction when cold is filtered, and a clear liquid obtained, holding dissolved all the arsenic originally present, even when a great portion of it existed in the state of tersulphide, from the action of sulphuretted products of decomposition. This solution is then in a suitable condition for being tested by Reinsch's process, but to fit it for Marsh's apparatus it is distilled to dryness, or almost to dryness. There is no frothing or any other difficulty until the liquid has nearly all passed over, when it is necessary to be careful. To the residue another half ounce of strong muriatic acid is added, and the distillation continued. On first applying heat after this addition, there is usually considerable frothing, lasting, however, for a few minutes only, after which the distillation can be carried to dryness without any difficulty. In this way a colorless acid liquid, well fitted for testing in Marsh's apparatus, is obtained, and a small *caput mortuum* entirely free from arsenic. This residue may be dissolved or oxidized by the usual methods, and examined for other metals. The distillate, instead of being tested in Marsh's apparatus, may be treated with sulphuretted hydrogen gas, when the yellow sulphide of arsenic, in a well characterized condition, is precipitated and may be collected and weighed. The arsenic present in the soil before referred to was estimated by this process, the precipitated sulphide being dissolved in ammonia, the solution evaporated to dryness, and the residue weighed. The residue remaining in the retort did not contain a trace of arsenic.

This process also serves for the detection of arsenic in the presence of certain metallic compounds which interfere with the action of Marsh's process, such as the salts of copper and mercury, in the presence of which no arseniuretted hydrogen is formed. The author states that the presence of bismuth does not at all detract from the delicacy of Marsh's test.

When oxidizing salts, such as chlorate or nitrate of potash, are present, which impede the action of this test, the author recommends their reduction by means of bisulphite of soda, the excess of sulphurous acid being afterwards driven off by heat.—*London Pharm. Journ. Jan.* 1860.

ON THE MOVEMENTS OF FLUIDS IN POROUS BODIES.

Among the topics of scientific interest which awaken attention at present, is the research of Jamin, professor at the École Polytechnique, upon the equilibrium and movement of fluids in porous bodies. The new results at which he has arrived afford an explanation of the ascent of the sap in vegetables without the necessity of recourse to the vital force. It is apparently a question of capillarity only.

Jamin has applied the new facts which he has discovered to the construction of an apparatus composed entirely of inorganic materials, but showing in its structure a great analogy with vegetables. This apparatus has the property of raising water as trees do, to a height greater than that attained by means of atmospheric pressure, from a moist soil, whence the water is constantly drawn to the factitious leaves where it is continually evaporated.

Reduced to its most simple form this apparatus is composed of a block of some well dried porous substance, as chalk, lithographic stone, &c., or a porous battery cell filled with a powder well rammed in, white chalk for instance, oxyd of zinc, or even with earth. A manometer is imbedded in the interior of the mass, and the whole is plunged in a vessel full of water. The water immediately penetrates its pores and drives out the air, which, collecting in the interior, exercises a pressure upon the manometer amounting with oxyd of zinc to *five* atmospheres, and with starch it exceeds *six* atmospheres. This is not the limit of the greatest possible pressure; Jamin makes known the causes which diminish it in these cases, and proves that the water is forced into porous bodies with a force which he calls π, and which is equal to that of a considerable number of atmospheres. A tube 1.20 metres long, filled with plaster and terminated at the summit by an evaporating surface, is inserted by its base into a reservoir closed and filled with water; a vacuum is caused, measured by 15 or 20 millimetres of mercury, or by 200 or 270 millimetres of water; and the water appears even at the upper extremity of the tube, which proves *that porous bodies are able to raise water higher than can be done by atmospheric pressure.* These facts cannot be explained by the ordinary laws of capillary attraction, since these bodies are not formed of impermeable tubes, but of corpuscles in juxtaposition, separated by small empty spaces. Jamin has therefore submitted the problem to the calculus and has come to results, of which we mention the following:

If in a damp porous body, the water is compressed by a power of several atmospheres, it can congeal only at a temperature below 0° C.* Consequently the old wood is able to resist frost, while the young shoots being less dense are unable to do so.

Since water in filtering through a porous body is compressed as it enters, and dilates again as it runs out, it should exhibit electric currents and many other phenomena.

The theory can not be applied to non-homogeneous porous bodies. In the extended memoir which he has prepared, Jamin discusses the complicated results which may be occasioned by irregularity of structure; he makes an application of it to wood, and shows that the interior pressure must be augmented in the denser tissues; that the air must come from the larger tubes, which cannot serve for the ascent of the sap.

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* This fact has just been demonstrated by Mr. Sorby, for water contained in capillary tubes of a small diameter.—J. N.

It is plain that the evident tendency of all these experiments is to explain the ascent of the sap in vegetables by capillarity. The idea is not new, but it has not been hitherto fully admitted, notwithstanding the experiments which have been heretofore made.

Jamin gives it probability in showing by decisive experiments, that porous bodies exercise a capillary action superior to the pressure of the atmosphere; further, he gives the physical theory of capillarity in porous bodies and succeeds in calculating the phenomena of the movement of liquids in trees. This is thoroughly physiological. If the Academy of Sciences could award the great prize for physiology, for a work upon fermentation, when it is not yet known whether this purely chemical phenomena is the result of vital action, as Cagniard de Latour maintains, or the manifestation of a mechanical effect as Liebig explains it, in his beautiful theory of fermentations,—if this work in chemistry deserved the great prize for experimental physiology, for a stronger reason should they award this prize for the splendid physical researches of which we have just spoken. —*Corres. of* J. Nickles, *in Am. Jour. of Sci. & Arts*, *May*, 1860.

NOTE ON A MANUFACTURED PRODUCT OF SEA-WEED CALLED JAPANESE ISINGLASS.

By Daniel Hanbury, F. L. S.

The communication to the Académie des Sciences of Paris by M. Payen* of the results of his examination of a gelatinous substance manufactured from sea-weed in China and Japan, induces me to offer a few additional remarks upon the same subject and also to draw the attention of the Society to some specimens of the substance in question. It will be most convenient to commence with the specimens of which I have two.

1. Under the incorrect name of *Japanese Isinglass*, there has been lately imported into London from Japan a quantity of a substance having the form of compressed, irregularly four-sided sticks, apparently composed of shrivelled, semi-transparent yellowish-white membrane; they are 11 inches long by from 1 to

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*Sur la Gelose et les Nids de Salangane, Comptes Rendus, Oct. 17, 1859.

1½ inches broad, full of cavities, very light (each weighing about three drachms), rather flexible but easily broken, and devoid of taste and smell. Treated with cold water, a stick increases greatly in volume, becoming a quadrangular, spongy bar with somewhat concave sides 1½ inches wide. Though not soluble in cold water to any important extent, the substance dissolves for the most part when boiled for some time, and the solution, even though dilute, gelatinizes upon cooling.

2. The second specimen, also from Japan (which I owe to the kindness of the late John Reeves, Esq.,) resembles the preceding in all its properties, but its form is very different, it being in long, shrivelled strips about ⅛ of an inch in diameter. These strips when immersed in water speedily increase in volume, and are then seen to be irregularly rectangular. This substance in color is usually whiter than the preceding ; it is also more readily soluble, cleaner, and altogether a more carefully manufactured article.

The substance under notice in all its forms is used by the Europeans in China as a substitute for true isinglass, for which many of its properties render it highly efficient. That which is perhaps most distinctive, is its power of combining with a very large proportion of water to form a jelly. This property is due to the principle named by M. Payen *Gélose*, of which the Japanese sea-weed product mainly consists. The jelly formed by boiling this sea-weed product or crude gelose in water, and allowing the solution to cool, requires a high temperature for fusion, differing in this respect from a jelly made of isinglass which readily fuses and dissolves in warm water. This character occasions a peculiarity in the taste of culinary jellies made of the new material, inasmuch as they do not dissolve in the mouth as ordinary animal jelly. The jelly of gelose is but little prone to undergo change—so little indeed that sometimes under the name of *sea-weed jelly*, it is imported to this country from Singapore, sweetened, flavored and ready for use, and in this state it may be kept for years without deterioration.

Gelose differs from animal gelatine, in not precipitating tannic acid ; from starch jelly, in not being rendered blue by iodine ; from gum, by its insolubility in cold water and its great gelatinizing power. From the mucilage of *Chondrus crispus,* named by Pereira *carrageenin*, it appears to differ chiefly in its power of combining with a great amount of water to form a jelly, which is not the case with carrageenin.

Of the botanical origin of crude gelose or Japanese isinglass and the mode of its preparation in Japan and China we are not well informed. M. Payen finds it may be extracted from many species of sea-weed, but especially from *Gelidium corneum* Lamour. and *Gracilaria lichenoides* Grev., the former of which yielded in his experiments to the extent of 27 per cent. *Gelidium corneum* is certainly used by the Chinese as I find by a small collection of economic Chinese *algæ* sent to the Society of Arts in 1857,† the specimens in which Dr. Harvey of Dublin has at my request been kind enough to examine and name. It appears however that several other sea-weeds are likewise employed by the Chinese, some of them on account of their gelatinous qualities; such are *Laurencia papillosa* Grev., *Laminaria saccharina* Lamour., *Porphyra vulgaris* Ag., and a species of *Gracilaria*, apparently *G. crassa* Harv. (Alg. Zeylan. No. 29.) Another sea-weed which is largely collected in the Indian archipelago for exportation to China, and which is one of the species known as *Agar-agar* is *Eucheuma spinosa* Ag.—*London Pharm. Jour. April*, 1860.

WEIGHING OF MOIST PRECIPITATES.

By Ferdinand F. Mayer.

Mr. Ch. Mène, of Creusot, (Journ. de Pharm. et de Chemie, Oct. 1858,) gives a mode of weighing which does away to a great extent with the tediousness and difficulties attending the drying of many precipitates, especially in volumetric analysis. He washes the precipitate thoroughly by decantation, and then introduces it carefully into a bottle, the exact weight of which, when filled with distilled water at a certain temperature, is known. Since the precipitate is heavier than water, the bottle when filled again will weighs more than without the precipitate, and the difference between the two weights furnishes the means of calculating the weight of the precipitate.

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†Journ. of the Society of Arts, 30th Oct., 1857, and 24th Feb., 1860.

In case the precipitate settles but slowly it may be collected on a filter, and together with the filter, after washing, be introduced into the bottle, in which case the weight of the filter and its specific gravity, supposing any difference should exist between its own and that of water, is to be taken in account. Precipitates soluble in or affected by water may be weighed in some other liquid.

This method, of which the above are the outlines, is spoken of in the Jahresbericht der Chemie for 1858 in rather disparaging terms, and I consider it not more than justice to the method, if not also to Mr. Mène, to prove its correctness, the more so as I have applied the principle on a large scale as far back as 1855.

I engaged in that year in the manufacture of carbonate of lead from refuse sulphate of lead, by treating the latter in a pulpy condition with carbonate of soda. The sulphate of lead I used contained very varying proportions of water and soluble impurities, from which latter it had first to be freed by washing. It was then in the state of a thin pulp, and the difficulty was to find the amount of dry sulphate of lead, as it was a matter of importance to use as little carbonate of soda, and to obtain as pure a carbonate of lead and sulphate of soda as possible. This could only be done by weighing it as whole, or in portions; but as the drying of a tubful of sulphate of lead (from 500 to 1200 pounds) was impracticable, and sampling not less so, since the upper strata contained a much larger proportion of water than the lead at the bottom; I contrived the following method, which enabled me to leave the management of the process in the hands of a workman.

I took a strong oaken pail, weighing eight pounds when empty, and caused a black mark to be burnt in horizontally around the inside of the pail, two inches below the rim, up to which mark it held twenty pounds of water. I reasoned as follows: The specific gravity of sulphate of lead being 6·3, the pail if filled up to the mark would hold 126 pounds of pure sulphate of lead. The specific gravity of water being 5.3 less than that of sulphate of lead, it followed that if there was one pound of water in the pailfull of moist sulphate, the pail would weigh 5·3 pounds less than 126 (+8, the tare of the pail) = 120·7 (+8); if there were two pounds of water present, the weight would be 115·4 (+8), and so on. This enabled me to calculate a table, giving in one column the actual weight of the pail when filled with moist sulphate, and opposite in a second column, the amount of dry sulphate corresponding to the gross weight. The weight of dry sulphate was thus found as accurately as could be desired, although the amounts varied in practice from 30 to 105 pounds.

It is nothing but an application of the Archimedean theorem, that, when a solid body is immersed in a liquid it loses a portion of its weight, equal to the weight of the fluid which it displaces, or to the weight of its own bulk of the liquid.

This, as I suppose, is precisely the principle applied by Mr. Mène. *The precipitate he obtains by a certain chemical manipulation is a substance of known composition and specific gravity.* Supposing it to be sulphate of lead, and the bottle, when filled with water at the normal temperature, to weigh 70 grammes = 50 grammes of water, and 20 for tare. After introducing the precipitate and filling again with water it weighed 71·06 grammes. Now, as the specific gravity of sulphate of lead is 6·3, or as the weight of a cubic measure of sulphate of lead is 6·3 times that of a cubic measure of water, and as the space of one part by weight of water is taken up by 6·2 parts by weight of sulphate of lead, it follows that the quantity of sulphate of lead in the bottle, which has taken up the space of one part by weight of water, increases the original weight of the bottle (filled with pure water) by 5·3. To find the amount of water displaced, it is only necessary to divide the overweight (1·06 grammes) by 5·3 = 0·2, which, added to the overweight 1·06 + 0·2 gives 1·26 grammes as the weight of the precipitate.

Hence the rule, which is of great convenience in volumetric analysis, that *to find the weight of a moist precipitate, which is a compound of known specific gravity, weigh it in a specific gravity bottle or some other vessel of known weight, when filled with water, or any other liquid, at the normal temperature, again fill it with the water or other liquid, divide the excess of the new weight by the specific gravity of the substance, less that of the water or other liquid* (*that of water being* = 1), *and add the quotient to the overweight, which gives the weight of the precipitate.*

The editor of the Jahresbericht appears to have overlooked the fact that the precipitates weighed in this manner are definite compounds, the specific gravity of which is well ascertained.

The principle I have exemplified above may not be novel; but as I have never met with it, chemists, as well as manufacturers (especially of colors), will probably also find it of interest, and certainly highly practicable and easy of execution.—*Am. Jour. Science and Arts*, *March*, 1860.

CRITICAL AND EXPERIMENTAL CONTRIBUTIONS TO THE THEORY OF DYEING.

Under this title a somewhat extended treatise, by Prof. BOLLEY of Zurich, has appeared in the L. E. and D. Philosophical Mag. [4] xviii. 481, Supplement to Dec. 1859.

Two questions have long been agitated among chemists interested in the theory of dyeing. (1.) In what part of the colored fibre is the coloring matter situated? Does it merely adhere to the surface, or does it penetrate the entire substance of the cell-walls of such fibres as cotton and flax? Or lastly, in the case of such fibres is it stored up in the interior of the cells? (2.) What is the nature of the union between the dye and the fibre? Is it a chemical combination, or is it due to mere surface attraction? After comparing the various theories which have been advanced during the last century and discussing the merits of each, the author records the results of his own experiments, from which it appears that wool and silk in all cases where they have not been dyed with colors in a mere state of suspension* seem to be impregnated with the dye throughout their entire mass; while in the case of cotton, by far the larger portion of the coloring matter adheres to the surface of the fibre, the penetration of the cell-walls by the dye being either very slight or altogether wanting.

That the theory of W. Crum (L. E. and D. Phil. Mag., April 1844,—compare this Journal [2], xxviii. 125),—in accordance with which the tubular form of the cotton fibres is an essential condition to their taking a dye, is unfounded, appears from the fact that the amorphous cotton-gelatine precipitated from its solution in cuprate of ammonia (see this Journal [2], xxvii. 118) may be mordanted and dyed like ordinary cotton. In like manner, sulphate of baryta and other pulverulent mineral bodies may be mordanted and dyed with decoctions of dyewoods.

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* In which case the coloring matter only adheres as a crust to the surface of the fibre.

With regard to the nature of the force which binds the coloring matter to the fibre—whether or no it be chemical attraction? Bolley concludes that there is no sufficient reason for accepting the view, principally developed by Chevreul [and by Kuhlmann, Comptes Rendus, tomes xlii. xliii. *et* xliv.] that dyeing is a direct consequence of chemical affinity. He believes that the power possessed by fibres of attracting certain bodies—whether salts or coloring matters or both—from their solutions, belongs to that class of phenomena which results from the action of finely divided mineral or organic bodies (charcoal or bone black for example,) on such solutions. The distinction between the action of charcoal and of fibres in thus removing saline matters, or dyes, from their solutions is one of *degree* only, the nature of the operation being identical in either case.

A given weight of well prepared animal charcoal can, as a rule, deprive a larger quantity of liquid of its color than an equal weight of wool or silk. Neither wool or silk can remove *all* the color from a solution as charcoal can, their effect extending only to a certain degree of dilution beyond which the particles of coloring matter resist their attraction. Dyes which may have been taken up without a mordant by wool, or, especially, by silk, may be removed again by long washing in water, a fact which is not true in the case of charcoal, or only to a very slight extent. The attraction of coloring matters for water is therefore more completely overcome by charcoal than by animal fibre; but even the cleanest vegetable fibres, as unmordanted and completely bleached cotton, possess a certain power of attracting coloring matter. That cotton should have less effect in this matter than wool or silk is not surprising in view of the great difference in the structure of cotton fibre as compared with that of the two substances last mentioned. It is well known that wool and silk in consequence of their physical constitution belong to the class of strongly absorbent or hygroscopic substances, *i. e.* in consequence of a certain porosity or looseness of their particles they swell up when moist and become easily penetrated by a liquid throughout their entire mass; on the other hand the cell-walls of cotton fibres are denser, less penetrable and at the same time thinner and therefore unable to contain the same quantity of liquid.

It has been often urged that since fibres, especially those of animal origin, not only exert an attraction for salts, &c., but also possess the power of decomposing some of them, their action must be chemical. But in this respect the behaviour of charcoal is similar to that of the fibres. So too with regard to the increased attraction for color exhibited by mordanted cotton which is on a par with the fact observed by Stenhouse that the decolorizing power of wood charcoal is considerably increased by precipitating alumina upon it.

According to the Author, mordants act by producing insoluble colors (lakes.) Their behaviour towards coloring matters in solution must be ascribed to chemical affinity, with which however the fibres themselves have nothing to do.

The so-called substantive dyes become insoluble from some other cause than the addition of a mordant; for example, oxydation of protoxyd of iron, or of white indigo.

That common alum, with which wood or silk has been impregnated, is able to attract coloring matter from solutions and precipitate it on the fibres depends not upon the strength of the chemical affinity of these fibres for the coloring matter, but upon the fact (experimentally proved by Bolley) that they become saturated with the alum, which cotton does not.—*Am. Journ. Science and Arts, May*, 1860.

ON THE ADULTERATION OF CARMINE.

By J. Attfield,

Demonstrator of Chemistry at St. Bartholomew's Hospital.

The coloring matter of the cochineal insect has been shown by Dr. De la Rue to be a definite, though scarcely crystalline, proximate principle; and from its source and properties has had the name *carminic acid* given to it. This acid united with about five per cent. of alumina, or sometimes with oxide of tin, and occasionally with albumen, should constitute the manufactured carmine of commerce.

The great value of carmine as a pigment depends upon the facts that it is richer, more transparent, and a smaller quantity goes further than any other color of similar hue. It is largely used by artists, especially in miniature painting, also by artificial flower makers, perfumers, confectioners, red-ink manufacturers, and—when mixed with powdered French chalk, starch, &c.—as a face-paint, under the name of *rouge.*

That for all these purposes carmine is adulterated is probably well known; indeed, its great expense would at once point it out as an article peculiarly liable to sophistication. Moreover, most of the works on Applied Chemistry indicate that it is likely to contain vermilion, and that a test of its purity is its being completely soluble in solution of ammonia, in which, of course, vermilion is insoluble. Practised artists well know this, and, as I am informed by Mr. Ince, often will not purchase carmine unless the test is performed in their presence.

The extent, however, to which this adulteration is carried is, I think, not generally suspected; nor is it commonly known that chrome-red (dichromate of lead) is often used as an adulterant in the place of the more expensive vermilion. For these reasons it has occurred to me that a statement of the results of a quantitative examination of fifteen different samples of carmine would not be without some practical interest to the members of the Society.

Starting with the assumption that carmine might be contaminated with vermilion, chrome-red, red lead, dragon's blood, and possibly some other matters that would be sure to show themselves in the course of analysis, the following was the method of examination finally adopted. A decigramme (one and a half grains) was digested for a short time in about half an ounce of weak solution of ammonia, the mixture thrown on to a weighed filter, and the filter washed with warm distilled water, dried at 212° F., and weighed; the loss of weight suffered by the decigramme would then indicate what per-centage of the carmine had been dissolved by the ammonia. In addition to carminic acid, the ammoniacal solution would, I suppose, contain any oxide of tin or albumen that might have been present; but, as these are necessary ingredients of carmine, and are never contained in that pigment in a sufficiently large quantity for them to be classed as adulterants, I did not think it important to take any further trouble about them. The filter, retaining alumina and the adulterating agents mentioned, was then treated with benzole, which has the property of dissolving dragon's blood with formation of a deep red solution. Dragon's blood was not, however, found in any of the samples, and the filter, after the benzole had been removed by evaporation, was in each case treated with hydrochloric acid; by this means everything was dissolved off except vermilion, which could be washed, dried, and weighed, the loss since the previous weighing giving, of course, the amount of alumina removed by the hydrochloric acid—red lead, and chrome-red not being found in any specimen that contained vermilion. If chrome-red were present in the sample, the filter, after treating with hydrochloric acid, was found to possess its original weight, and, therefore, the difference between that and the previous weighing gave the amount of chrome-red, including what little alumina might be present with it. In all cases the presence of the substances enumerated was confirmed by qualitative examination. Red lead was not found in any of the specimens examined, and of course alumina was not classed as an adulterant. It was not perhaps necessary to further recognize the vermilion, as scarcely any other coloring matter could be found under such circumstances; nevertheless, the test for that substance given some years ago by Bolley (*Annales de Pharmacie*, 75, 239,) was found to be so very applicable that it was always used. It consists in adding to the vermilion a drop or two of solution of nitrate of silver containing considerable excess of ammonia; a black color is quickly produced owing to the formation of sulphide of silver. The method of applying the test consisted simply in placing a drop of it on the filter over which was spread the vermilion from the decigramme of carmine, when a black spot was instantly produced.

The following table exhibits at a glance the results of the examination :—

Composition of Commercial Carmine.

	In 100 Parts.					
	Carmine.	Alumina.	Vermilion.	Chrome-Red.	Cost of 10 grs.	Actual Value of ditto.
I.	99.4	.6			5*d.*	5*d.*
II.	63.0	6.0	31.0		5*d.*	3½*d.*
III.	35.5	say 2.0		62.5	10*d.*	2*d.*
IV.	91.5	‘‘	a trace 8.5	chiefly	4*d.*	4¾*d.*
V. In powder	76.7	3.6	19.7.		10*d.*	4*d.*
Va. In lumps	90.7	3.6	5.7		7½*d.*	4¾*d.*
VI.	46.6	3.4	50.0		3½*d.*	2½*d.*
VII.	26.8	say 2.0		71.2	3*d.*	1½*d.*
VIII.	29.4	2.1	68.5		4*d.*	1¾*d.*
IX.	21.8	7.2	71.0			
X.	28.3	6.0	65.7			
XI.	28.2	4.0	67.8			
XII.	96.2	2.5			7*d.*	5*d.*
XIII.	95.2	2.5			7*d.*	5*d.*
XIV.	23.0	a trace	77.0		1*s.* 5*d.*	1¼*d.*

The first eight samples were purchased at the leading retail drug establishments of the north, south, east, and west ends of London. Number nine was from a large wholesale perfumer, said to be a manufacturer of carmine; numbers ten and eleven were from a wholesale druggist—they are probably identical, though said to be of different qualities; numbers twelve and thirteen were from first-class artists' colormen; and number fourteen from a West-end house generally noted for the sale of pure chemicals.

Differing as these samples do in the amount of adulteration practised, it is not surprising that equal weights should differ also in price. One would expect, however, that the less real carmine a specimen contained the less price it would be charged; and in some instances this is the case, though, to be sure, even here we find the percentage of real carmine decreasing in a far greater ratio than the cost. But in the other adulterated samples the very reverse obtains; for the more the money that is paid for them so much the less is there of carmine contained in them; this is peculiarly the case in numbers five and three, but especially so in number fourteen—the sample from the establishment noted for unsophisticated preparations—ten grains of which cost seventeen-pence, but have a real value, as compared with number one, of only five farthings. Number one was taken as the standard of comparison, first because it is pure, and second because it was obtained from a West-end house, than which there is none in the trade better able to judge of the price an article should be supplied at.

It will be observed that in the foregoing examination no notice is taken of the possible admixture of inferior with superior tinted carmines, or of the adulteration of carmine with other lakes of a similar color. An attempt was made to give expression to the varied intensity of color of the several ammoniacal solutions of the carmines, but without any definite success. Of course, of two specimens both perfectly soluble in solution of ammonia, that one would be the better which has the deepest and richest hue, provided always that equal weights of the two have been taken.

In conclusion, this examination shows that, except for the use of first-class artists, carmine is nearly always largely adulterated. That the adulterant used is generally vermilion, but sometimes chrome-red. That the price of carmine is far from being a good indication of its real value ; and that the only test of its true worth is its apparent perfect solubility in solution of ammonia combined with richness and depth of color in the resulting solution.—*London Pharm. Journ. May*, 1860.

ON THE COMPOSITION OF VEGETABLE GUMS.

M. E. Fremy* has communicated to the French Academy the results of a very interesting and important investigation into the constitution of the gums, and the mode of their production in the vegetable organism, which opens up an entirely new view of the subject. He had been led, by his valuable researches on the gelatinous bodies, and their isomeric transformations, which are found present in the utricular tissues of plants, to consider that the gums might be arranged into a series of bodies comparable to those derived from pectose ; he therefore undertook their investigation.

M. Fremy found that concentrated sulphuric acid was capable of effecting a complete modification of gum arabic, and of converting into a new body perfectly insoluble in water. The experiment is conducted in the following manner :—A mucilage of gum arabic is first prepared, so thick that it will scarcely run from the vessel containing it ; this is then poured into a glass containing concentrated sulphuric acid. The mucilage floats on the surface of the acid without any admixture taking place ; the contact is allowed to continue for several hours, and ultimately the gum is found to be transformed into a kind of membrane, which is insoluble in boiling water. This substance, when properly washed, does not retain a trace of sulphuric acid. For reasons which will be more obvious presently, M. Fremy names this body *Metagummic Acid.* This acid resists for many hours the action of boiling water, even under pressure ; but if heated with small quantities of any base, such as the alkalies or alkaline

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[*M. Fremy gives no credit to Lowenthal and Neubauer who discovered the acid nature of arabin in 1855, see Chem. Gazette, vol. xiii. pp. 412, from Jour. fur Prakt. Chem. lxii. p. 193.—Ed. Am. Jour. Pharm.]

earths, it immediately dissolves and undergoes another modification; for acids do not precipitate it from the solution. The new body, therefore, now in combination with the base, is termed *Gummic Acid.* M. Fremy states that he has studied this action of bases on metagummic acid with the greatest care, and he finds the resulting compound to present all the characters of gum arabic. These experiments tend then to cause us to entirely alter our ideas of the nature of the gums. Instead of regarding gum as a neutral body, somewhat analogous to dextrine, it must be considered as derived from a principle, metagummic acid, insoluble in water, which under the influence of bases becomes soluble, is converted into gummic acid, and in combination, generally with lime, forming a veritable salt, constitutes ordinary soluble gum. To confirm this view, M. Fremy carefully examined natural gum. It was previously known that gum cannot, in any case, be purified from the inorganic bodies which it contains, and that, upon calcination, it always leaves a calcareous ash amounting to 3 or 4 per cent. Moreover, mucilage always furnishes a precipitate with oxalate of ammonia. When solution of gum is treated with subacetate of lead, an insoluble compound is formed, and under these circumstances the lime is separated from the organic acid, and remains in solution combined with acetic acid. When metagummic acid is boiled with lime, a soluble substance is obtained identical with gum arabic; it is neutral, insipid, uncrystallizable, soluble in water, and precipitated by alcohol and subacetate of lead; calcined, it leaves an ash, amounting to 3 per cent., like gum arabic.

All these facts demonstrate that gum is really a compound of lime with an organic acid, and not an immediate neutral principle. By the action of oxalic acid the lime may be separated from gum, without the production of metagummic acid. This transformation may, however, be then readily effected by the application of heat. M. Gélis has made an interesting observation on gum arabic. He found that by a temperature of 150° cent., sustained for many hours, gum becomes insoluble in water, but that by subsequent prolonged boiling it passes back again to the state of ordinary gum. Under these circumstances no elimination of lime takes place, but the gum or gummate of lime undergoes an isomeric modification, and metagummate of lime is produced. It may, therefore, be readily comprehended why the body obtained by M. Gélis is reconverted by the simple action of boiling water, while metagummic acid, obtained by the method described, is only transformed under the influence of bases. Considering the very feeble saturating power of the class of acids to which these bodies approximate, it is not astonishing that the lime salt should only contain three per cent. of lime. M. Guérin-Vary has shown that the gum of the cherry-tree contains a soluble substance, which is identical with gum arabic, and also that the insoluble gelatinous substance or cerasine is, by prolonged ebullition, rendered soluble, and converted also into gum arabic. M. Fremy shows that the alkaline carbonates react rapidly upon the cerasine, giving rise to carbonate of lime, and a gum entirely comparable to that obtained by the direct action of the base on metagummic acid. The dilute acids in the cold decompose cerasine, removing the lime and eliminating metagummic acid, which, by boiling with lime, yields ordinary gum. Cerasine, then, is not an immediate neutral principle, but a combination of lime with metagummic acid. It is identical with the insoluble product obtained by M. Gélis in heating gum to 150° C. The two bodies reproduce gum arabic under the same circumstances. This transformation, which is effected by the action of boiling water, may also take place under the influence of vegetation; it is therefore natural to meet in the vegetable organism with mixtures of gum arabic and cerasine—they constitute two isomeric states of the same lime salt.

There remain other gums, such as tragacanth, which are apparently distinct from the preceding in their properties and their constitution. It results from M. Fremy's experiments that tragacanth contains an acid gelatinous substance, presenting a certain analogy to metagummic acid, but which is nevertheless distinct. When the insoluble matter of gum tragacanth is submitted to the action of the alkalies and alkaline earths, veritable gummy substances are obtained, soluble, insipid, uncrystallizable, insoluble in alcohol, like gum arabic, but precipitated by neutral acetate of lead, which, as is known, has no action on ordinary gum. It results, then, from these latter observations, that the gelatinous bodies contained in the gums may be converted into soluble compounds by the action of boiling water or bases, but that the resulting substances do not always present identical properties.

The soluble gums, true lime compounds, appear then to be derived from several gelatinous principles, and constitute several terms of the same organic series.

M. Fremy sums up the results of his investigations as follows:—

1. Gum arabic is not an immediate neutral principle; it must be considered as a combination of lime with a very feeble acid, soluble in water, and named *gummic acid.*

2. This acid may undergo an isomeric modification and become insoluble, either by the action of heat or by the influence of concentrated sulphuric acid. It is then named *metagummic acid.*

3. The bases, and principally lime, transform this insoluble acid into gummate of lime, which presents all the chemical characters of gum arabic.

4. The soluble lime compound which forms ordinary gum, may also undergo by heat an isomeric modification, first shown by M. Gélis, and is transformed into an insoluble compound, which is metagummate of lime. This insoluble substance is rendered soluble by the action of boiling water, or under the influence of vegetation. It exists in the vegetable organism; it forms the gelatinous part of certain gums, as that of the cherry; it is found in the ligneous tissue, and in the fleshy pericarp of several fruits. Its isomeric modification illustrates the formation of soluble gums.

5. There exists in the vegetable organization several insoluble gelatinous bodies, which by their transformations produce different gums. Thus, the insoluble part of gum tragacanth, modified by the action of alkalies, gives a gum which must not be confounded with gum arabic. Reagents establish a striking difference between these bodies.

6. When it is seen with what facility gum and its derivatives may, by undergoing an isomeric modification, be transformed into insoluble substances, a hope arises that a practical application in the arts may result, and that it may be employed like albumen for fixing insoluble colors.—*London Pharm. Jour. April,* 1860.

PROCEEDINGS

OF THE

National Convention for Revising the Pharmacopœia of the U. States.

The Fifth Decennial Convention for Revising the U. S. Pharmacopœia met in the city of Washington, at Willard's Hall, at 10 o'clock, A. M. May 2d, 1860.

Dr. George B. Wood, President of the Convention of 1850, was called to the Chair, and Dr. John C. Riley, of Washington, appointed Secretary *pro tem.*

Dr. Thomas Miller, of Washington, moved that a committee of five be appointed to nominate permanent officers of the Convention. This was carried, and Dr. Aikin, of Baltimore; Dr. E. R. Squibb, of New York: Dr. Bridges, of Philadelphia: Dr. Fuller, of Maine, and Dr. Thomas Miller, of Washington, were so appointed.

This committee, having retired for consultation, returned and reported the following names:

For President,—Dr. Geo. B. Wood, of Philadelphia.

For Vice Presidents,—Dr. Jacob Bigelow, of Boston; Dr. Edward Warren, of North Carolina.

For Secretary,—Dr. Thos. Miller, of Washington.

For Assistant Secretary,—Dr. John C. Riley, of Washington; all of which were accordingly elected by the Convention.

On motion, a Committee on Credentials was appointed, consisting of William Procter, Jr., of Philadelphia; Dr. Thomas Miller, of Washington, and Dr. Cutter, of Massachusetts.

This committee reported the following delegates as present at the Convention, viz:

From the College of Physicians of Philadelphia—Dr. George B. Wood and Dr. Robert Bridges.

From the New York State Medical Society—Dr. Caleb Green and Dr. E. R. Squibb.

From the New York Academy of Medicine—Dr. E. R. Squibb.

From the College of Pharmacy of the City of New York—John Meakim and William Hegeman.

From the Philadelphia College of Pharmacy—William Procter, Jr., A. B. Taylor, and Edward Parrish.

From the Maine Medical Association—Dr. A. J. Fuller and Dr. H. T. Cummings.

From the Connecticut State Medical Society—Dr. Guerdon W. Russell.

From the Massachusetts Medical Society—Dr. Jacob Bigelow and Dr. Ephraim Cutter.

From the Jefferson Medical College—Dr. Franklin Bache.

From the University of Pennsylvania—Dr. Joseph Carson.

From the Medical Society of the District of Columbia—Dr. Thomas Miller, Dr. William G. Young, Dr. Joshua Riley, Dr. John C. Riley and Dr. N. S. Lincoln.

From the University of Maryland—Dr. William E. A. Aikin.

From the Maryland College of Pharmacy—Alpheus P. Sharp.

From the United States Army—Dr. Lewis A. Edwards.

From the United States Navy—Dr. George Clymer.

Dr. George B. Wood, Chairman of the Committee appointed in 1850, for the Revision and Publication of the Pharmacopœia, presented his report, and also a supplemental report in reference to the second edition published by authority of the Committee in 1855, which were read and referred to an Auditing Committee, consisting of the Secretary and Assistant Secretary.

It was, on motion of Dr. Carson, resolved that such members of the two Houses of Congress as are medical graduates, be invited to attend the Convention, and participate in its deliberations.

The delegates of the several bodies represented in the Convention were then called on for contributions towards a revision of the Pharmacopœia, when reports were handed in from the Massachusetts Medical Society by Drs. Cutter and Bigelow; from the New York Academy of Medicine and New York College of Pharmacy, by Dr. E. R. Squibb, (a joint report); from the New York College of Pharmacy, by William Hegeman, (a special report); from the College of Physicians of Philadelphia, by Dr. Robert Bridges; and from the Philadelphia College of Pharmacy, by Wm. Procter, Jr.

Mr. Edward Parrish presented a report from the American Pharmaceutical Association, a body not incorporated and not represented in this Convention, which was received.

Dr. Carson moved that these reports be referred to a committee of five, with directions to report a plan for the revision and publication of the Pharmacopœia, which was unanimously carried.

The President then appointed the following gentlemen, viz: Dr. Franklin Bache and Mr. Edward Parrish, of Philadelphia; Mr. Alpheus P. Sharp, of Baltimore; Dr. Thomas Miller, of Washington, and Dr. Guerdon W. Russell, of Connecticut.

On motion of Dr. Miller, the Convention then adjourned until to-morrow morning, May 3d, at 11 o'clock.

Second Session, May 3d, 1860.

At 11 o'clock the chair was taken by Dr. George B. Wood, of Philadelphia, the President of the Convention, and the minutes of the meeting of the preceding day were read and approved.

Mr. Procter, from the Committee on Credentials, reported the presence of the following additional delegates: From the Delaware State Medical Society, Dr. F. H. Askew; from the Maryland College of Pharmacy, Mr. George W. Andrews; from the Massachusetts College of Pharmacy, Messrs. Charles T. Carney and Robert R. Kent; and from the New York College of Pharmacy, Alex. Cushman.

Dr. Miller, from the Auditing Committee, stated that the report of the revising and publishing committee, appointed in 1850, had been examined and found correct.

Dr. Bache, from the Committee on a Plan for the Revision and Publication of the Pharmacopœia, reported the following resolutions:

1. *Resolved*, That a Committee of Revision and Publication be appointed, consisting of nine members, of which the President of this Convention shall be one, to which shall be referred all communications in relation to the revision of the Pharmacopœia, and that three of this committee shall form a quorum.

2. *Resolved*, That the committee shall meet in the city of
and be convened as soon as practicable, by the Chairman.

3. *Resolved*, That the committee shall be authorized to publish the work after its revision, and to take all other measures that may be necessary to carry out the views and intentions of the Convention.

4. *Resolved*, That the committee shall have power to fill its own vacancies.

5. *Resolved*, That after the completion of its labors, the committee shall transmit a report of its proceedings to the Secretary of this Convention, to be laid before the next Convention.

Dr. Miller moved to consider the report, resolution by resolution, which was passed.

Dr. Bigelow, of Boston, moved to fill the blank in the second resolution with the word *Philadelphia*, which was passed, and the report then unanimously adopted.

Mr. Meakim, of New York, moved that a committee of one from each delegation present, be chosen to nominate eight members of the committee on revision and publication of the Pharmacopœia.

Dr. Miller moved to amend this by making it one from each State and Territory represented, including the Army and Navy.

Dr. Askew, of Delaware, moved as a substitute for the whole resolution, that the President directly appoint the committee on revision and publication, which was rejected, and the motion, as amended by Dr. Miller, was unanimously adopted.

On motion of Dr. Bache, a recess of ten minutes, to confer with the President on the subject of appointing the nominating committee, was had, after which the meeting was resumed, and the President announced the following gentlemen as the committee:

Mr. A. B. Taylor, of Philadelphia; Mr. W. Hegeman, of New York;

Dr. A. J. Fuller, of Maine; Dr. G. W. Russel, of Connecticut; Dr. Jacob Bigelow, of Massachusetts; Dr. Joshua Riley, of District of Columbia; Mr. A. P. Sharp, of Maryland; Dr. H. F. Askew, of Delaware; Dr. Lewis A. Edwards, U. S. Army; Dr. George Clymer, U. S. Navy.

Dr. Bache moved that the Chair appoint a committee of five, to report a plan for organizing the Convention of 1870, which was carried, and the following gentlemen were appointed, viz: Dr. F. Bache, Dr. E. R. Squibb, Dr. Miller, Mr. George W. Andrews, and Dr. Joseph Carson.

On motion of Dr. Bache, a recess of half an hour was taken to allow the two committees to consult and report.

On coming again to order, Dr. Askew read the report of the nominating committee, which proposed for the Committee on Revision and Publication of the Pharmacopœia the following gentlemen:

Dr. Franklin Bache, of Philadelphia; Dr. E. R. Squibb, of New York; Mr. C. T. Carney, of Massachusetts; Dr. George B. Wood, of Philadelphia; Dr. H. T. Cummings, of Maine; Mr. William Procter, Jr., of Philadelphia; Dr. Joseph Carson, of Philadelphia; Mr. William S. Thompson, of Baltimore, and Mr. A. B. Taylor, of Philadelphia.

The report was accepted, and its nominations confirmed.

The committee to make arrangements for the Convention of 1870 reported, through its chairman, Dr. Bache, that the same rules as adopted in 1850 for the present Convention be taken, by simply changing dates.

This report was adopted.

Mr. Wm. Hegeman, of New York, moved to ask an expression of the opinion of the Convention in reference to the subject of a bill now before Congress to provide for the greater security of the medical profession and the public in the matter of importation of drugs and medicines.

The President thought that though the subject mentioned by the gentleman was one of high interest and importance to the general profession, yet it would be better for the Convention to confine its deliberations to the specific matter which had called them together.

Mr. Parrish thought that great praise was due to the New York Collage of Pharmacy for their action in reference to establishing standards for the strength and purity of drugs and medicines, but at the same time he deemed it not within the scope of the objects of the present Convention to interfere with the matter.

Mr. Carney, of Boston, thought the cause of pure drugs and medicines before Congress might be advanced by a simple expression of opinion by this body.

The President said that there would soon meet two bodies, the American Medical Association and the Pharmaceutical Association, for the consideration of whom the measure proposed would be altogether appropriate.

On motion of Dr. Carson, several sections of the bill before Congress were read.

Dr. Bache, whilst acknowledging the great importance of the matter, deemed it not germane to the objects of this Convention, and therefore moved to lay the subject on the table; which was accordingly done.

Mr. Meakim called the attention of the Convention to a proposition of the New York College of Pharmacy, which he embodied in a resolution, and moved—

That in the index of the Pharmacopœia, the syllables of both Latin and English names be so divided and accented that the index may also serve as a pronouncing vocabulary to the Materia Medica.

This subject was learnedly debated by Dr. Bache, Dr. Askew, and others, when—

Dr. Askew moved to refer the subject to the Commtitee on Revision and Publication, to be acted on or not according to its discretion.

On being put, this motion was lost by 9 ayes to 12 noes.

The resolution of Mr. Meakim was then put, and a new debate arose; when the resolution was carried by 12 ayes to 10 noes.

Mr. Meakim next called the notice of the Convention to its title of the "National Medical Convention," &c. &c., and moved to change to "The Pharmacopœia Convention."

Dr. Bache proposed merely to strike from the present name the word "Medical;" which was put to the vote and carried unanimously.

So the Convention will be called "The National Convention for Revising," &c. &c.

On motion of Mr. Procter, a contribution was then made by each of the members present to defray the contingent expenses of the Convention.

Mr. Procter spoke in favor of having a low priced edition of the Pharmacopœia for more general distribution among Pharmaceutists, which would do much to insure uniformity in the preparation of medicine, &c.

The subject was discussed by the President, Dr. Bache, and Mr. Procter, when the matter seemed to be remitted to the discretion of the Committee on Revision, who were stated by the President to be always anxious to furnish an edition at the lowest price at which it could be done.

Dr. Carson offered the following resolution, which was unanimously adopted:

Resolved, That the thanks of this Convention be presented to Messrs. J. C. and H. A. Willard, for the kindness and courtesy conferred by them in placing their Hall at the service of the Convention.

Mr. Parrish introduced the subject of uniformity of weights and measures by the medical profession and by the apothecaries of the country. He advocated making the avoirdupois ounce the standard of weight, as was advocated in England.

The President thought the Convention could not discuss this subject with profit in the short time allotted to it.

Mr. Meakim thought it best to begin now if any thing was to be done in the future.

Dr. Bache moved that Mr. Taylor, of Philadelphia, be invited to express his views on the subject of weights and measures, which was carried.

Mr. Taylor then addressed the Convention in advocacy of abolishing the troy and avoirdupois scales now in use, and substituting the grain as the unit for all weights less than a pound avoirdupois—beyond that he would use pounds. He would also do away with Roman symbols, and use the common Arabic figures. He thought this better than the plan now proposed in Great Britain.

Dr. Squibb read an extract from the united proceedings of the New York Academy of Medicine and the New York College of Pharmacy on this subject.

Mr. Parrish advocated the abolition of the present anomalous weights, and was in favor of the avoirdupois ounce and pound.

Mr. Procter also favored the adoption of avoirdupois weight as the only one to be used.

Dr. Bache thought it better, for the sake of uniformity, to wait the action of the British Commissioners on the subject of the consolidation of the London, Edinburgh and Dublin Pharmacopœias into a British Pharmacopœia. He was himself against changing the troy grain, and hoped the British Commissioners would not. He preferred the French system *grammes* and *centigrammes,* doing away the *decigrammes;* but as there was little hope of this system being adopted in Great Britain, it would be best to wait and see what was done there before we act.

Mr. Meakim advocated the " grain" standard.

Mr. Parrish preferred the ounce.

Mr. Procter said that even in France now, in many of their best works on pharmacy, they virtually reject the decimal division and go back to the old ante-revolutionary division of half, quarters, eighths, sixteenths, &c. by often employing numbers of grammes which bear these relation to each other.

The subject of weights and measures was then dropped.

Dr. Squibb moved a vote of thanks to the President, the Secretary, and Assistant Secretary, when, on motion of Dr. Bache, the Convention adjourned *sine die.*

After the adjournment of the Convention, Mr. Thomas E. Jenkins, of Kentucky, presented to the Secretary his credentials as a delegate from the College of Physicians and Surgeons of Louisville, Ky.

Editorial Department.

The Pharmaceutical Convention.—Since our last issue this important Convention has met and transacted the business required by its constitution, viz: Providing for its re-organization in 1870, and appointing a Committee of Revision, with power to print and publish the new Pharmacopœia.

The details of the meeting at page 370, are taken chiefly from the official copy of the proceedings, furnished by the Secretary of the Convention to the Committee of Revision, and are more correct than the Reports taken from the newspapers, all of which contain errors.

It will be perceived that the pharmaceutical element of this Convention was duly appreciated, and in the Committee for carrying out the work of Revision and Publication, a majority belong to that profession. This union in labor will have the happiest effect in rendering the Pharmacopœia at once practical, and acceptable to those for whose use it is destined. The propriety of placing the work at a low price was also agreed to, and there is no good reason why every apothecary and druggist in the country should not possess a copy. It will be the interest of the publisher to stereotype the work and put it at the lowest possible price, and in that case unusual exertions should be made by the Colleges of Pharmacy to extend its circulation far beyond that of previous editions. The Committee meets every Wednesday evening, (at 8 P. M., at the house of Dr. Bache,) except the first Wednesday of the month, and have already had three meetings. Dr. Franklin Bache is Chairman, and Alfred B. Taylor, Secretary.

Legislation on the Sale of Poisons.—The apothecaries were recently taken by surprise by the announcement in the newspapers of the passage, during the late session of the Legislature of Pennsylvania, of a law on this subject, which rendered them liable to being fined for selling certain poisons unless with specified precautions. From the Druggist's Circular we learn that the New York Legislature also passed a law more stringent and applying to a larger number of poisonous articles than that of this State. The following is the Pennsylvania law, viz.:

> "No apothecary, druggist, or other person shall sell or dispose of by retail any morphia, strychnine, arsenic, prussic acid, or corrosive sublimate, except upon the prescription of a physician, or on the personal application of some respectable inhabitant, of full age, of the town or place in which such sale shall be made. In all cases of such sale, the word *Poison* shall be carefully and legibly marked or placed upon the label, package, bottle, or other vessel or thing in which such poison is contained; and when sold or disposed of otherwise than under the prescription of a physician, the apothecary, druggist, or other person selling or disposing of the same, shall note in a register kept for that purpose, the name and residence of the person to whom such sale was

made, the quantity sold, and the date of such sale. Any person offending herein shall be guilty of a misdemeanor, and on conviction be sentenced to pay a fine not exceeding fifty dollars."

The general effect of this law will no doubt be useful, if its provisions are carried out by apothecaries and druggists, and all should endeavor to do so as strictly as possible, at least in spirit if not in letter. There are, however, some points arising out of its application which need attention. After setting forth to what class of persons only the apothecary and druggist shall dispose of poisons, viz., those presenting a physican's prescription, and those considered to be "respectable inhabitants of full age," &c., the law says, "in all cases of such sale, the word *Poison* shall be carefully and legibly attached," &c. Now if we understand the tenor of the law, it means that when a physician prescribes either of the five poisons named in the law, the apothecary is bound to mark the vial or package with the word *poison*. Will physicians submit to this? Is the apothecary justified in construing the law as applying to unprofessional demands only? If not, must it apply to every case where the poison is diluted or associated in mixtures with other drugs, equally with those cases where sold pure and unmixed. In a word, must the Liq. Morphiæ Sulphatis of the Pharmacopœia, and a solution of a grain or two of corrosive sublimate in a pint of syrup of sarsaparilla, be marked *Poison?*

In our private opinion the law was framed to meet a particular class of cases, where these poisons are sold in a pure and concentrated form, and better adapted to be used maliciously, or with evil intent, and hence only those more commonly used for that purpose are named. If it were not so, why were not the long list of narcotic and irritant poisons named in the law, as opium and its preparations, aconite, veratria, tartar emetic, belladonna, croton oil, elaterium, etc? And if the poisons of the law were intended to be marked "poison" when prescribed by the physician, why was not the same requirement extended to those other poisons which are more frequently prescribed?

In regard to that part of the law requiring registration, it is all right and proper, and apothecaries and druggists should carry it out conscientiously for their own sakes and for the public good; yet there is one case of frequent occurrence which will cause trouble, if literally construed. We mean where the head of a family sends a servant for corrosive sublimate for vermin—a very frequent occurrence. In such case can the apothecary consider the servant or messenger as a "respectable inhabitant" in the view of the law? If not, will a note from the "head of the family," by the servant known to be such, be a sufficient guarantee? if not, and the head of the family has to come and make "personal application," it will create great difficulty.

Before leaving the subject, it may be interesting to give a sketch of the requirements of the New York law, which we take from the Druggists' Circular for June 1860.

> "The New York law, as reported in this paper, requires that persons who sell poisons shall register the names and residences of parties purchasing, unless in cases of a physician's prescription. The labelling must be attended to properly. The poisons here referred to, are arsenic and its preparations, oxalic acid, corrosive sublimate, chloroform, sugar of lead, tartar emetic, opium and its preparations, oil of bitter almonds, the cyanides, deadly nightshade, and poison hemlock."
>
> "The sale of the following poisons by retail is prohibited, except by the written order of a regularly authorized practising physician, whose name and residence shall be attached to such order: prussic acid, aconite and its preparations, atropia and its salts, cantharides, croton oil, daturia and its salts, delphinia and its salts, digitalis and its preparations, nux vomica and its preparations, elaterium, ergot and its preparations, veratria and its salts, and cannabis indica and its preparations. A fine of 100 dollars may be recovered for a violation of these restrictions."

This law, if literally carried out, will occasion much trouble to the apothecaries, and in practice it will be found nearly impossible, from the fact that various of the articles named are already in common legitimate family use, and for every demand the law requires a physician's prescription.

Dr. Coates' Address.—In our last number reference was made to the Address of Dr. Benjamin Hornor Coates before the County Medical Society, and we propose to offer a few comments upon some of its remarks bearing on the apothecaries of Philadelphia. As page 22 occur the following lines:

> "If Jeshurun be representative of our apothecaries he has certainly, in some instances, waxed fat and kicked. Occupying, first, the wholesale drug business, he has also largely partaken of the sale of toilet and fancy articles. In other cases, it may be, he tends a little to emaciation. The result is, as far as stands conspicuous to the public eye, the appearance of multitudinous establishments throughout the city, an army of young men, a college, with its officers and appurtenances, the accumulation of large fortunes, and an active share in the administration of diversified public institutions: whilst Jeshurun retains the title of an apothecary, and more or less prepares and supplies drugs. Is the scientific and life and death parts of an apothecary's labors a thing so slight and limited as to require the occupation of so small a portion of human existence, and to leave leisure for all these glories? Or has their profession embraced all the genius of the city?"

It would not, perhaps, be difficult to analyze the motives which suggested this extraordinary paragraph, yet as it does no harm, unless to the author, we pass it by without further notice than to say, that we see no reason why an apothecary should not, like any other citizen, give a portion of his time to public interests of a benevolent or educational character, when his business arangements admit of his doing so.

At page 23 Dr. Coates says, "A few years since a conference was held between Committees of the College of Physicians and that of Pharmacy; the results of which were published in the form of recommendations." It is true that some years since a conference of committees of the bodies mentioned, did take place at the request of the former, chiefly in regard to an alleged infraction of the rights of physicians by apothecaries prescribing at the counter, but so far as we remember, no such result as that stated by

Dr. Coates flowed from the interview. But some time after, a similar joint commission of the County Medical Society, (the body represented by Dr. Coates,) and of the College of Pharmacy, did issue a joint report, addressed first to physicians, and then to apothecaries, chiefly in regard to the writing and dispensing of prescriptions, and certain ethical rules which should be observed in the professional intercourse of physicians and pharmaceutists. That report, it is true, was chiefly written by the apothecaries, but it was revised by the physicians, and by them finally copied for presentation to the respective bodies represented. The report was printed in volume 24, page 27, of the Journal from that manuscript. With what justice then does Dr. Coates remark in regard to these recommendations, "How far will physicians comply with the demands, not recommendations, of a College of Medicine—No! of Pharmacy?" In our opinion, these recommendations did much good in this community at the time, among those who received them in the candid spirit in which they were offered, as a remedy, however faulty, for evils that were acknowledged to exist, and we would gladly see them republished now.

Very ridiculous, as well as very annoying incidents and mistakes have no doubt occurred in the long experience of Dr. Coates, with the apothecaries of Philadelphia. That in reference to the cineritious oxide of mercury, would, perhaps, if criticized, react unfavorably to the author's chemical recollection. We have, however, no inclination to reprint these instances of ignorance, or carelessness, or want of judgment, and among the tens of thousands of prescriptions annually dispensed in this city, it were, indeed, remarkable if some even worse than these did not occur. Yet, on the other hand, the agency of these same apothecaries in protecting physicans from their own *faux pas*, we should gladly have seen acknowledged. Ludicrous as may be some of the errors of apothecaries, and serious as may be others, their exaggerated counterpart in the written prescriptions of physicians can be shown, in the experience of many pharmaceutists, by reference to the prescription file or record book. We are among those who believe that the apothecary is in duty bound to exercise a watchful care over the perscriptions he dispenses, in view of the many circumstances which tend to cause physicians to err in writing their prescriptions; and we do not agree with those who hold that the prescription is always a sufficient warrant to blindly dispense it according to the letter. In this sense, as well as in the Scriptural, sometimes "the letter killeth."

As regards writing the names of substances prescribed, in English, we heartily agree with Dr. Coates in condemning it as unwise and uncalled for, deeming the use of the officinal Latin names far less liable to cause errors than their often numerous synonymes in English. But we think the direction intended for the patient, when appended to the prescription, should be written in English without abbreviation, word for word as it is to appear on the label. The good sense of the physician will at once endorse the propriety of making the direction as brief as a clear expression of his wishes will justify; and we can with pleasure bear testimony to the general observance of this rule in the practice of the physicians of Philadelphia.

At page 25 Dr. Coates observes, in regard to medical patronage: "Two principles, both of them praiseworthy, have been in action at the same time in this business. One of them, felt as liberal, and as open to the improvements of the age, is that all apothecaries of reasonable qualification should be allowed a fair and equal chance; and that it is worse than absurd to pass by a respectable store and go to a distance to get what the near and meritorious man will furnish equally well. The other is, that a physician should be familiar with all the apothecaries' shops to which he sends for drugs, in order to judge of the qualities and often very different strength of the articles which he directs to be procured, to avoid ambiguities, and to be sure that such errors as we have described may not be committed, but the intention of the prescriber be carried out, and even that time and confidence too may not be lost."

Dr. Coates has fairly stated these two principles, both of which are in operation in this city. The first is certainly the practice that should obtain where the apothecaries deserve confidence, and the physician is fully entitled to feel satisfied on this point. We believe it is not difficult for an intelligent physician to form a pretty correct opinion of an apothecary's ability to understand his prescriptions, and to dispense them correctly, by the occasional intercourse which results in his practice in various neighborhoods; and we believe it is a satisfaction to most apothecaries to have physicians to manifest this interest by calling and examining any preparations in which they may feel interested on behalf of their patients, when it is done in a friendly manner. But when a family have long and satisfactorily dealt with an apothecary, it certainly is not right that a physician, except in special cases, should send his prescriptions to another store, without good reason, and thus convey the inference that the apothecary does not understand his business.

The *second* principle is attempted to be carried out by some physicians, so far as to induce their patients, wherever located, to deal at a limited number of shops, with the economy of which they believe themselves to be familiar, but which is often far from being the case. It is true that where a great number of precriptions of a given physician are received by an apothecary, he is more apt to know the habits and peculiarities of the prescriber, and to be able better to correct his oversights; but we have known of great liberties on the part of the apothecary to arise from this confidence. It is unfortunately true that physicians, as a mass, are not so practically familiar with the medicines they prescribe as to be able always to decide their merit by external observation, and they are often influenced to a surprising extent in the use of remedies by the business tact and enterprise of some apothecaries, who, like the French masters of the *cuisine* serve up old dishes in new seasoning, which by their novelty of aspect, or taste, inspire hopes of increased curative power, whilst in reality no such increased influence exists.

Dr. Coates concludes his remarks on apothecaries by a series of questions, the more pointed of which we quote:

1. "Can a physician, with a safe conscience, recommend an apothecary's establishment, of the contents and management of which he has no knowledge, merely on the ground that the master of it is a man of personal worth, and has acquitted himself creditably of a course of pharmaceutical studies? 2. Can a shop in which fancy articles and others of general trade are sold, be conducted so well as one devoted exclusively to Pharmacy? 3. Is not the putting up of prescriptions quite sufficient occupation for one establishment? 4. Is it not a sufficient profession to last a man his life time, and can he convert it into a wholesale business without causing a wrong? 5. Can a city like Philadelphia support, for Pharmacy alone, more than a limited number of apothecaries' stores? 6. Is it not easier to Inspect a limited number of establishments than a larger one? 7. In a duty important to life, health and the peace of families, is it not right to give employment, in preference, to those who understand their business well and discharge it with attention and care; not allowing their performance of it to be interrupted by levity and talk? In fine, is a physician to blame who makes himself acquainted with a particular establishment, and makes it a condition with his patients that his prescriptions should be put up there?"

Of the above questions we should answer Nos. 2, 6 and 7, in the affirmative; Nos. 3 and 5 in the negative, and the remainder according to circumstances; but we have not space for further comment, and leave our readers to draw their own conclusions in regard to the character and scope of Philadelphia pharmacy if it was regulated by the views of Dr. Coates.

The following was received just as we were going to press:

AMERICAN PHARMACEUTICAL ASSOCIATION.—Notice.

The Eighth Annual Meeting of the "American Pharmaceutical Association," will take place in the city of New York, on Tuesday the 11th day of September next, at 3 o'clock P. M.

The objects of the Association and the conditions of membership are explained in the following extracts from the Constitution.

Article I.

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable Pharmaceutists and Druggists of the United States in the following objects:

1st. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2d. To establish the relations between druggists, pharmaceutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3d. To improve the science and the art of Pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5th. To suppress empyricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

Article II.—*Of the Members.*

Section 1. Every pharmaceutist or druggist of good moral and professional standing, whether in business on his own account, retired from business or employed by another, who, after duly considering the objects of the Association and the obligations of this Constitution, is willing to subscribe to them, is eligible to membership.

Section 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said Committee. If after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association, and he may be elected by two-thirds of the members present, on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Section 3. No person shall become a member of this Association until he shall have signed the Constitution, and paid his annual contribution for the current year. All persons who become members shall be considered as permanent members, but may be expelled for improper conduct by a vote of two-thirds of the members present at any annual meeting.

Section 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-President and Secretary, covenanting to return the same to the proper officer on relinquishing their connection with the Association.

Section 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being ballotted for.

Pharmaceutists and Druggists desirous of membership, can make application to any of the officers, or obtain any information from them respecting the Association. Applications for membership should be in the hands of the Executive Committee at the opening of the first session. Reports of Committees, and papers presented for publication, should be written only on one side of the paper, and corrected for the printer.

All interested in the objects of the Association are invited to co-operate.

SAM'L. M. COLCORD, President.

Boston, June 20th, 1860.

The Peninsular and Independent Medical Journal.—The publishers of this Journal have announced in the twelfth number of the second volume, its discontinuance, on the score of not having paid its way. We regret this result the more, as to a certain extent that Journal was pharmaceutical, having a pharmaceutical editor and a special department for pharmaceutical articles; but whilst regretting this issue, we are not surprised, when the large and increasing number of medical periodicals is considered.

Cavendish Society.—For the information of our chemical readers, we reprint from the Chemical News of March 10th, 1860, the following Report of the last meeting of this Society. Subscribers will see that the 13th volume of Gmelin is to be the only book for 1859, and those who wish to get it should send in their subscriptions ($5) for 1859, that they may be forwarded to the Society.

The Thirteenth Anniversary Meeting of the Cavendish Society was held at the rooms of the Chemical Society Burlington House, on Thursday the 1st of March, at 3 o'clock, P. M.

The Master of the Mint, President, in the Chair.

The Secretary read the following Report of the Council:

In the last Annual Report, the Council stated that the thirteenth volume of Gmelin's *Handbook of Chemistry* was then in progress, and was intended as a book for 1859. The completion of this volume has occupied a longer time than was anticipated, partly in consequence of the editor having to wait for a portion of the German edition which is comprised in it, and partly in consequence of the extensive additions of new matter which had to be made in the form of appendix. It is now ready for distribution, and the large amount of matter it contains, will, it is hoped, compensate in some degree for the unavoidable delay that has occurred in supplying it to the subscribers.

The Council are unable to hold out the prospect of any other volume being supplied for 1859, and must refer to the statement made in the last Report for an explanation of the causes which have contributed to limit the issue of books during the last two or three years.

The propositions, originating from several sources, which have been made with reference to works thought to be suitable for publication by the Society, and some of which were referred to in the last Annual Report, have received the attention of the Council, and have been fully discussed on repeated occasions. The conclusion to which the Council have arrived, after mature consideration, accords with the opinion expressed in the Report of last year, which is, that the whole of the resources of the Society should be concentrated upon the completion of the few remaining volumes of Gmelin's *Chemistry* before any other work is undertaken. This opinion, they have reason to believe, is also in accordance with that of the majority of the members of the Society. In the present state of the Society, the attempt to bring out any other work in conjunction with the *Handbook of Chemistry*, would necessarily retard the completion of the latter, as the means at the disposal of the Council are insufficient for the production of more than one large volume a year, while an apparently insurmountable obstacle is presented to the extension of the number of subscribers by the necessity imposed on new members to provide a large number of the preceding volumes of the work now in progress, in order to make their sets complete. Attempts have been made to overcome this difficulty, but without success; and even if, in other respects, it were possible, the small stock of the early volumes left on hand, would so far limit the power of enlarging the Society in that way that no sufficient increase could be derived to justify any material augmentation in the expenses of publication.

The present income of the Society, if maintained, will be sufficient to enable the Council to bring out what remains to complete the works of Leopold Gmelin as fast as it is produced by the German editors; and at the same time to add, in the form of an appendix, all new matters relating to those parts of organic chemistry treated of in the preceding volumes. The matter thus added to the volume now in course of distribution occupies two hundred pages. These additions, which are made to each succeeding volume of the work, may be regarded as "Annual Abstracts of Papers on Chemical Science," which some of the members of the Society suggested to the Council, in a communication noticed in the last Report, as suitable for publication. The Council are glad to be enabled thus far to meet the wishes expressed by members, without retarding the progress of the work which all seem desirous to expedite, or involving the Society in liabilities beyond the current means.

A new part of the German edition of the *Handbook* has just appeared, the translation of which will at once be proceeded with, and there is every reason to believe that the supply of matter will be kept up, so as to admit of the publication of a volume, with the usual additions, or abstracts of papers, every year, until the completion of the work.

The preparation of an index to the whole of the volumes is now occupying the attention of the Council.

When Gmelin's work has been brought to a conclusion, a suitable opportunity will be presented for considering the course to be pursued with reference to the future. The obstacle to the extension of the Society, to which allusion has been made, will then cease to exist. New works may be undertaken, for the selection of which ample time will have been afforded. These may resemble in character the works previously produced, or it may be thought desirable to undertake works of a different description, which would attract a new class of members, and the extension or reconstruction of the Cavendish Society would be the probable result.

The Council feel, however, that they cannot too strongly impress upon the members the importance of retaining the support of all the present subscribers to the Society, until the work on which they have been so long engaged is brought to a satisfactory conclusion.

It was moved by Dr. ROSCOE, the Local Secretary for Manchester, seconded by Mr. DANIEL HANBURY, and carried unanimously: That the Report just read be received, approved, and adopted.

Before the report was adopted the meeting was addressed by Dr. BASHAM and another subscriber, who complained of the slowness with which the Society's books were published, and suggested that some smaller volumes might be issued while the publication of Gmelin's *Chemistry* was proceeded with, which would have the effect of keeping the subscribers together, and possibly of increasing the number.

They were replied to on the part of the Council by Dr. LONGSTAFF and Mr. MASKELYNE, the former of whom asserted that the difficulty was not so much financial as in finding suitable works to publish. The latter stated that he had entered the Council with just the same opinions as Dr. Basham, but on thoroughly investigating the affairs of the Society he had become convinced that it would not be safe to undertake any other work while the publication of Gmelin's *Chemistry* was in progress. When that work was finished the Society might be reconstituted, and the publication of others commenced.

In answer to a further question from Dr. Basham, the Secretary and Mr. WATTS stated that the completion of Gmelin's *Chemistry* and the copious index would probably occupy three more volumes, and the publication extend over three more years. The last part of the work issued in Germany had but just been received, and the translation of it would be immediately proceeded with.

The thanks of the meeting were voted to the President, Council and Officers, also to the Local Secretaries.

THE MÉNIER MATERIA MEDICA PRIZE.—By a decree of the Emperor Napoleon, dated Dec. 17, 1859. The superior school of Pharmacy, of Paris, is authorized to accept an annual donation of 500 francs, from M. Ménier, to found a prize, devoted specially to Materia Medica, to be called the Ménier prize, and when it is not adjudged, the amount will accrue towards augmenting the prize given in the year following.

M. Ménier is the well known Pharmacien Druggist of Paris.

APPOINTMENTS.—Robert Bentley, F. L. S., M. R. C. S., &c., Professor of Botany and Materia Medica to the Pharmaceutical Society of Great Britain, has been appointed Professor of Botany in Kings College, London, in place of the late Prof. Arthur Henfrey.

M. J. Regnauld, M. D., Pharmacien of the first class, has been named Professor of Pharmacology to the Faculty of Medicine of Paris, in an imperial decree, dated, Nov. 13, 1859, the same chair vacated by Soubeiran, and which was then entitled the chair of Pharmacy. It appears that advantage has been taken of the temporary vacation of this chair, to reorganize it on a new and more extended basis.

Dr. William Pepper, of Philadelphia, has been elected to the chair of Theory and Practice, in the Medical Department of the University of Pennsylvania, to fill the vacancy occasioned by the resignation of Prof. George B. Wood.

DR. EDWARD WARREN, of Edenton, North Carolina, has been elected to the Chair of Materia Medica in the University of Maryland, vacated by the decease of Dr. Fricke.

THE

AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1860.

ON SOME POINTS OF CHEMICAL THEORY, ON THE AMMONIA- AND AMMONIUM-BASES, AND ON THE NATIONAL PHARMACOPŒIA; being Extracts from the Introductory Lecture, delivered before the Class of Jefferson Medical College, of Philadelphia, October 14, 1858. By Franklin Bache, M. D., Professor of Chemistry in the College.

It is well known that the ponderable elements have fixed combining weights, called their equivalents, which form a chain of ratios, representing the proportion in which they unite with one another. This fixedness of the combining ratios by no means implies that they shall be necessarily represented by whole numbers. In order that they may be whole numbers, their relation must be such, that they may be all divided by the same number without a remainder. Prout contended at an early period, that the combining numbers were divisible in this way; in other words, that they might be divided by some number forming the common divisor of them all. The number which he selected for the common divisor was the combining number of hydrogen, which he fixed at one. Accordingly, he said that his common divisor, one, was contained in the combining number of hydrogen once, in the combining number of carbon, six times, in the combining number of oxygen, eight times, in the combining number of nitrogen, fourteen times, and so forth. Berzelius, to the last moment of his life, rejected the law of Prout, that the combining numbers are exactly divisible by a common divisor; and, accordingly, in the cases of the elements just named, he represented their combining weights by the average numbers, deduced from his best analyses; even though the numbers obtained varied from a whole number by an amount so small as not to exceed the inevitable error of the best conducted analysis. At a comparatively recent period, Dumas undertook a research for the express purpose of determining whether the law of Prout was well-founded, at least so far as those elements are concerned which have a small combining weight; and the result of his examination has been, that, setting out with the hydrogen standard unit, carbon may be represented by 6, oxygen by 8, and nitrogen by 14, without any appreciable error. The proof of the accuracy of these numbers is so convincing, that, at the present day, the whole chemical world adopts them. The next important step in this investigation relates to the combining weight of chlorine. A number of skilful chemists have labored to determine its combining weight; as it is the hinge on which a great many analyses turn. It was found to be between 35 and 36, and for many years, 35·42 was adopted as a close approximation to the truth. These investigations, therefore, militated against Prout's law, as he enunciated it; for 35 and a fraction is not an exact multiple of 1. The investigation of the number for chlorine has been lately resumed by Dumas and other distinguished chemists, who have settled down in the belief that 35·5 is its correct combining weight. Prout's law, as laid down by him, constituted one case only under the general law, that all the combining numbers are divisible by the same number without a remainder. The case, adopted by Prout under the general law, was to make the divisor equal to the hydrogen combining weight, which, consequently, contained the divisor once. But the verity of the general law did not depend upon its being true in this particular case; but its truth depended upon this; namely, whether there could be found any number which would be contained in all the combining numbers, an exact number of times without a remainder. Let us see, then, whether the adoption of the number, 35·5 for chlorine, militates against the general law, as we have given it. To decide this question, let us select five-tenths as the common divisor. Thus, five-tenths are contained in 1, the hydrogen number, twice; in

6, the carbon number, twelve times; in 8, the oxygen number, sixteen times; in 14, the nitrogen number, twenty-eight times; and in 35·5, the chlorine number, seventy-one times. In this way it is shown, that the adoption of 35·5 as the number for chlorine, is not inconsistent with the general law of exact multiples; though it does not permit of the selection of unity, that is, the equivalent of hydrogen, for the common divisor.

If we suppose that the final result of the investigation, now in progress, shall be to prove that the common divisor of all the equivalents is a number, equal to half the equivalent of hydrogen, the question still remains to be answered, what hypothesis shall we adopt to explain this curious relation of the equivalent numbers? The most plausible one is that the common divisor represents the equivalent of an unknown element, which would, therefore, have an equivalent weight, half that of hydrogen. Dumas throws out this conjecture, and broaches the hypothesis that all the so-called elements may possibly be formed of one kind of matter; the unknown element being the parent matter, out of which all the other elements are formed, by its addition to itself, condensed to a greater or less degree. This hypothesis of the essential identity of all matter, appears to me to be extremely improbable.

It is now more than thirty years, since a German mineralogist called my attention to the fact, first observed, I believe, by the German chemists, that several cases existed, where three elements, having similar properties, formed a triad, and possessed equivalents, so peculiarly related, that, if the largest and smallest were added together, and divided by 2, the quotient would be the intermediate equivalent. This curious relation of the equivalents of allied elements was at first thought to be fortuitous, and likely to disappear when the numbers were more correctly determined. The progress of science, however, has not realized this surmise; but, on the contrary, rather gives support to the alleged relation. Dumas has recently taken up this subject, and has brought forward so many cases in support of the relation, that it may be considered almost as a law. Thus 16, added to 64, the equivalents of sulphur and tellurium, gives 80, the half of which, namely 40, is the equivalent of selenium. Again, 20 and 68, the equivalents of calcium and barium, added together, make 88, and this number, divided by 2, gives 44, the equivalent of strontium. Once more, 7 and 39, the equivalents of lithium and potassium, added together, make 46, which number, when halved, gives 23, the equivalent of sodium. Chlorine, bromine and iodine are three elements, connected by the closest affinities. Here, according to Dumas, we have the equivalents, 35·5 for chlorine, 80 for bromine, and 127 for iodine. Let us see whether these numbers support the law. They certainly do not, very exactly; for, to confirm the law, the equivalent of bromine should be 81·25, instead of 80. Nevertheless, the departure from conformity to the law is not very great; and, when we reflect how nice a problem it is to obtain the equivalents of bromine and iodine exactly, from the difficulty of purifying these elements, we may be permitted to suppose, that new determinations may possibly alter the equivalents, 80 and 127, for bromine and iodine; although Dumas states that he obtained these numbers after the most careful experiments.

Before leaving this subject, I will mention a kindred one; namely, that two equivalents have, sometimes, the simple relation to one another of one to one, or of one to two. Thus, manganese and chromium have, according to Dumas, the same equivalent number (26), and we all know that the equivalent of sulphur is exactly double that of oxygen.

Perhaps I have occupied too much space with these curious speculations respecting the equivalent numbers. Hypotheses, however, are not without their use, and, if they lead us to interrogate nature by experiment, are often productive of fruit. Theories are more useful than hypotheses, because they embrace an extended generalization of facts, or supposed facts; still, they are liable to be changed with the progress of our knowledge. "A theory in chemistry," as Gregory has very happily expressed it, "is nothing more than such a view as groups together the largest number of facts at a given time; and has no pretensions to absolute truth, nor to be more than a guide to the inquirer, and an aid to his memory."

One of the most important sets of compounds, known to the chemist, is the series of homologous carbohydrogens, each containing a progressively increasing amount of carbon, represented, in equivalents, by the even numbers, 2, 4, 6, 8, &c., up to 60;

with but few chasms in the series, and these are filling up gradually by new discoveries. In these compounds the hydrogen uniformly exceeds the carbon, in number of equivalents, by one equivalent; and, consequently, is represented by equivalents, which gradually rise by the odd numbers, 3, 5, 7, 9, &c., up to 61. These carbohydrogens are *positive radicals*, each of which has a protoxide, that is, an ether; and also a hydrated protoxide, that is, an alcohol. Take from each of these positive radicals, two equivalents of hydrogen, which makes the hydrogen fall below the carbon, in number of equivalents, by one equivalent, and they are converted into *negative radicals*, each of which has a derived acid, all of similar constitution, being uniformly hydrated teroxides. Of the positive radicals, the first five in the series, namely, methyl, ethyl, propyl, butyl and amyl, are the most deserving of study; because they form a key to the knowledge of the principal ethers and alcohols.

In order to introduce to your notice the important doctrine of chemical substitution, which has been so fertile of new discoveries, I must remind you of the composition of the compounds of nitrogen and hydrogen. Ammonium is a compound radical, which consists of one equivalent of nitrogen and four of hydrogen. Withdraw the hydrogen gradually, one equivalent at a time, and you have, first ammonia, then amide, and, finally, imide; the latter being a compound of single equivalents of nitrogen and hydrogen. It is only lately that imide has been recognised under a distinct name. It is now many years since I pointed out in my lectures, that such a compound exists in hydrocyanic acid, associated with carbon, and mentioned how important it would be, for the elucidation of the laws of combination, to obtain it in a separate state; since it is composed of single equivalents of nitrogen and hydrogen. This compound, though now named, has not, indeed, been isolated, but may be transferred to different substances, so as to form various combinations.

Now, ammonia is a fertile source of substitution-compounds. It may have one, two, or all of its equivalents of hydrogen replaced by certain compound radicals, which fit, as it were, the place previously occupied by the hydrogen. We have, when one equivalent of hydrogen is replaced, amide bases; when two equivalents are replaced, imide bases; when three are replaced, that is, all the hydrogen, nitryl bases. Of the ammonia there is left, in the first case, amide; in the second case, imide; in the third, nitrogen alone. Hence the names of these three classes of bases. The compounds which come in by substitution, are, principally, the five positive radicals, methyl, ethyl, propyl, butyl and amyl, already mentioned. The names of all the bases, thus formed, end with the syllables, "amine," as an abbreviation of the word, ammonia. Suppose one equivalent of methyl to be substituted for one equivalent of the hydrogen of ammonia; the amide base, thus formed, is called methylamine. In a similar way the names, ethylamine, propylamine, butylamine, amylamine, &c., are formed. The imide bases are more complicated; for here two equivalents of hydrogen undergo replacement, which may be done by two equivalents of the same radical, or by one equivalent of two different radicals. Finally, the nitryl bases are formed from ammonia by the replacement of all three of the equivalents of hydrogen; and here the replacing radicals may be all alike or all different, or two alike and the third different. From this sketch it must be evident, that these substitution-bases, derived from ammonia, are very numerous, and, at the same time, difficult to name.

Ammonium is considered by many chemists to be a compound metal. It was so considered by Berzelius; and hence he gave a metal termination to its name. Now, ammonium is the type of a set of bases, called ammonium-bases, which are even more interesting than the ammonia-bases. Thus, some of the nitryl bases are capable of uniting with one equivalent of a radical, additional to the three equivalents of radicals, already present by substitution. These four equivalents of radicals are, of course, united with one equivalent of nitrogen; and, hence, the compound is supposed to assimilate in constitution to ammonium, which is composed of four equivalents of hydrogen and one equivalent of nitrogen. For example, suppose triethylamine, which is a nitryl base containing three equivalents of ethyl, to unite with one additional equivalent of ethyl—not by substitution, for there is nothing for it to replace, but by what may be called annexation—and we get the ammonium-base, consisting of one equivalent of nitrogen and four equivalents of ethyl, called tetrethylammonium. Now, when it is considered that the four eqs. of hydrogen in ammonium may undergo a quasi-displacement by four eqs. of radicals, all of them the same or all different, or partly the same and partly different, it is easy to understand that the ammonium-bases, if all discovered, would be very numerous. Already a large number of them have been obtained, chiefly through the labors of Hofmann. What is most singular in regard to these bases is, that, when converted into hydrated protoxides, they form compounds analogous to the hydrated protoxides of potassium and sodium, that is, to caustic potassa and soda; for, they have a caustic taste, saponify oils, and are capable of neutralizing acids. They have the bitterness of quinia, and it is not improbable that they may hereafter prove to be valuable remedies.

Organic chemistry, or the chemistry of the compounds, produced, for the most part, under the influence of the vital force, forms the most interesting, and, at the same time, difficult department of the science. The compounds known are very numerous, and but imperfectly understood; and the number of possible combinations is almost infinite. The great problem of modern chemistry to be solved, is to determine to what extent it may be possible to produce, artificially, the products of vital action. The production of the animal base, urea, by Wöhler, was the first example of an organic product, artificially formed, if we except oxalic and hydrocyanic acids. Two other bases of animal origin, namely, glycocin or sugar of gelatin, and kreatinin, have been artificially produced; and more recently, a number of vegetable organic bases have been formed by art. The discovery of these artificial bases is a step in the right direction, and well fitted to throw light on the nature of the natural bases, as to the manner in which these are built up under the influence of the vital force. The usual processes of the chemist have the effect of reducing more complex to less complex molecules; but, in order to succeed in producing the natural bases, his mode of proceeding must be reversed. He must build up more complex molecules from those that are less so, and thus imitate nature. This has been done in the formation of the bases, furfurine and amarine; and is there not room to hope, that the time will come when we shall be able to produce quinia and morphia artificially? Indeed, the attempt has already been made by Hofmann to form quinia from quinoline, a principle found in coal-tar. Quinoline is a volatile oily base, which is likewise obtained from quinia and the other alkalies of Peruvian bark, as also from strychnia, when these substances are severally heated with caustic potassa. Here we have a case of transformation under the influence of potassa, which consists in reducing a complex molecule to a more simple one; but the converse reaction, which would imply the power of converting quinoline into quinia, &c., is quite a different thing, and much more difficult to accomplish. The recent researches of Wöhler, Blyth and Anderson have shown that narcotin, acted on by the deutoxide of manganese and sulphuric acid, is susceptible of numerous transformations, which throw a valuable light on the true constitution of the natural organic alkalies. Methylamine has been found among the products of the decomposition of morphia, codeia and caffein, and probably forms a constituent of these substances. By the action of nitric acid, brucia yields several products, among which is methyl, a fact which renders it probable that this radical pre-exists in it. These and similar facts lead to the conclusion, that chemists are on the eve of discovering a method of producing artificially some of the natural organic alkalies.

Should our hopes, in this respect, be disappointed, still it is highly probable that the artificial organic alkalies, the number of which is rapidly increasing by new discoveries, will furnish the physician with some valuable remedies. Already furfurine, in the form of nitrate, has been used as an antiperiodic. It is bitter, like quinia, and approaches, in composition, to several of the natural organic alkalies. For its discovery we are indebted to Fownes. Amarine, another artificial alkali, would probably prove an active remedy, and deserves a fair trial.

Within a recent period, the chemist has presented us with several principles, extracted from plants, which have proved to be more or less febrifuge. In proof of this it is only necessary to call attention to salicin, phloridzin, and picrolichenin, all of which, upon trial, have been found to be efficacious in arresting fever. At this time, particularly, this class of vegetable principles deserves to be studied in relation to their therapeutic applications; as a well-founded fear is entertained that the cinchona trees of South America are in danger of being wholly exhausted.

When we consider the numerous contributions, made by chemistry to medicine, in the form of some of our most valuable remedies; and when we reflect that the future is as likely to be prolific in chemical discoveries as the past, we cannot fail to perceive, that to no science can the physician or pharmaceutist direct his attention with a greater prospect of enriching the healing art than to chemistry. The medical applications of the science are far from being all known. Chemical substances may yet be discovered, which shall rival, as therapeutic agents, ether and chloroform. The practical application of ether, as a means of abolishing pain, is exclusively an American discovery; and the subsequent use of chloroform for the same purpose, is only making a second, but far less important step in the same direction. Ether is a safe anæsthetic, and it is claimed that chloroform, *when properly used*, is safe also. Gregory has asserted, that, in Edinburgh, where chloroform has been employed in more, perhaps, than 100,000 cases, no instance of death has occurred from its use; and he attributed the fatal cases that have taken place elsewhere, either to the use of impure chloroform, to the unfitness of the cases in which it was employed, or, finally, to the administration of an over-dose. The question of the comparative merits of ether and chloroform as anæsthetics is a practical one, and must be decided in favor of ether; for, while safety requires that certain precautions shall be observed in giving chloroform, the neglect of these is attended with little or no danger in administering ether.

Chemistry has thrown an important light on certain dietetic articles, which are used by all civilized nations, and, after having been once adopted by them, have never been known to be laid aside. I allude to coffee and tea, and to the Paraguay tea and guarana of South America. The instinct of the human stomach, it would seem, leads different nations to adopt these substances as a drink; they being valued for their invigorating and refreshing qualities. The most enlightened nations employ, for the most part, coffee and tea; and, if our best writers were willing to own it, they would acknowledge their obligations, for much of their inspiration, to these beverages. Now, all these substances contain the same essential principle, namely, caffein; although the substances themselves are derived from plants, belonging to four distinct botanical families. Chocolate furnishes another drink, employed like coffee and tea. This substance, it is true, is devoid of caffein; but it contains theobromin, a principle closely allied to caffein.

A few remarks will now be made on the beautiful chemical relations which subsist between plants and animals. The vital processes of vegetation are uniformly those of deoxidation, and the liberation of oxygen; while those occurring in animals are the reverse, or oxidation. The vital processes in plants consist in building up complex molecules, by means, for the most part, of deoxidation; the same processes in animals are characterized by the reduction of complex molecules to more simple ones, effected by oxidation. If plants alone existed, the oxygen of the atmosphere would be increased and its carbonic acid diminished, and plants would perish for want of carbon. If animals alone existed, the oxygen of the atmosphere would be diminished, and its carbonic acid increased, until at last it would become unfit to support animal life. By this wonderful compensation, effected by the vital action of plants and animals, the atmosphere is kept unchanged in composition; and, while plants give out oxygen, animals consume it, converting it into carbonic acid, which in turn furnishes part of the food of plants; they appropriating the carbon, and giving out the oxygen, to be returned once more to the atmosphere.

Organic chemistry is an extremely important study for the medical man. The chemical examination of plants throws much light on the vegetable materia medica, and is often rewarded by the discovery of the essential principles of our medicines, on which their activity depends. The analysis of animal parts and products, both healthy and diseased, furnishes information, highly important in the diagnosis and treatment of disease. What would have been the present state of pathology, let me ask, had the physician been deprived of analyses of the blood and urine? It will not be saying too much to assert, in view of the analytic precision attained at the present day, that the chemical study of the animal secretions will, for the future, form the surest means of advancing practical medicine.

The labors of physiological chemists have pretty well settled the general principle, that the material by which our bodies are sustained, may be conveniently arranged under the heads of blood-producing food, and food which is principally consumed, during the process of respiration, in generating animal heat. The blood-producing food, consisting chiefly of albumen, fibrin and casein, contains nitrogen; while the heat-producing food is devoid of that element. Very complicated formulæ are assigned to the blood-producing principles, giving, according to some authorities, more than one hundred equivalents to two of their elements, namely, carbon and hydrogen. Such formulæ cannot be supported by analysis with any show of probability. Nevertheless, there are chemists, who take these improbable formulæ as proved; and venture to trace the transformations which the blood-producing principles of the food undergo, during their conversion into blood. Thus, they say, that casein, with a certain proportion of water, may yield blood-albumen and chondrin, the latter being the principle of cartilage; and, again, that two equivalents of albumen and two of water are equal to one equivalent of blood-fibrin, one equivalent of choleic acid, and one equivalent of gelatin. The equations here given are true equations, on the assumption that the composition of the substances concerned is correctly represented; but this assumption is wholly gratuitous. Admitting, however, that the analyses are correct, can it be believed that equations like these represent the truth of nature? These chemists, drawing on their fancy, do not hesitate to make any transformation that may suit their theoretic views. If they have too much oxygen to suit their views, oxygen is alleged to be given off; if there is present too much of both oxygen and hydrogen, then water is formed; and, if carbon is redundant, they do not hesitate to say that the portion in excess is removed, in the form of carbonic acid, by the oxygen of the air! This scientific facility reminds me of an ancedote which is related of one of our commissioners of patents, who was in office about the beginning of the present century. He was a man of general information, but had no pretensions to a knowledge of science; and to him, in his own opinion, every thing was easy to accomplish. Being simple-minded and credulous, he was easily imposed upon. A wag applied to him for a patent for making boards out of sawdust. Oh! my friend, said the commissioner, that art has long been known, and is very easy. But, said the applicant, I fear, sir, you do not exactly understand my purpose. My invention consists in making *pine* boards out of *oak* sawdust. Oh! is that it, rejoined the commissioner; but that is very easy also, for you have only to add a little turpentine!

Our National Pharmacopœia was first published in 1820, under the authority of a Medical Convention, which met in Washington in that year. The credit of originating this work belongs to the late Dr. Lyman Spalding, of the State of New York. Agreeably to the recommendation of the first Convention, the work has been revised, by similar authority, at intervals of ten years; namely, in 1830, '40, and '50. It fell to my lot to assist in all these revisions; and it is natural that I should feel a deep interest in the approaching revision, which is to take place in 1860.* Before the appearance of our national standard in 1820, we were embarrassed by the conflicting authority of the three British Pharmacopœias, emanating severally from the Colleges of Physicians of London, Edinburgh and Dublin; and even since its appearance, we have still felt the disadvantage of the conflicting formulæ and nomenclature of these authoritative works. From an early period, British practitioners admitted the evil of having three Pharmacopœia standards; but how to remedy it was the great difficulty. If the British Colleges of Physicians could have agreed upon a common standard, the evil would have been removed; but their views were too conflicting, and all their attempts to construct a British Pharmacopœia proved fruitless. It is now more than twenty years since I received a letter from that distinguished chemist, the late Dr. Edward Turner, of London, in which he alluded to this subject, and gave it as his opinion, that no hopes can be entertained that the British Colleges will ever lay aside their local preferences, and agree upon one national standard; and that nothing but the strong arm of Parliament could effect that desirable object. In my Introductory of 1854, I made some remarks on the intimate connection between American and British Pharmacology; and, after having spoken of the advantages which would flow from the adoption of a single Pharmacopœia for the British Empire, I endeavored to show that the only way to reach the evil was the one pointed out by Dr. Turner. Wishing to make known these views to the reading public, I had the part of my lecture relating to them published in this Journal, for January, 1855; and, subsequently, I was gratified to find that the extract was copied into the Pharmaceutical Journal, of London, for March of the same year. I have entered into these details, in order to convey to you the gratifying intelligence, that the British Parliament, after repeated failures for more than a quarter of a century, has at last passed a bill, the object of which, as stated in the preamble, "is to enable persons, requiring medical aid, to distinguish qualified from unqualified practitioners." The powers conferred by the bill are vested in a "General Council of Medical Education and Registration," consisting of eighteen members; twelve appointed by twelve medical corporations in England, Scotland, and Ireland, one by each, and six by the government. Among the powers conferred on the General Council, is that of publishing a single Pharmacopœia for the British Empire. The words of the act conferring this power are as follows: "The General Council shall cause to be published under their direction, a book containing a list of medicines and compounds, and the manner of preparing them, together with true weights and measures by which they are to be prepared, and containing such other matter and things, relating thereto, as the General Council shall think fit, to be called 'British Pharmacopœia'; and the General Council shall cause to be altered, amended, and republished such Pharmacopœia as often as they shall deem it necessary."

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* Dr. Bache is chairman of the committee, now engaged in the fourth revision of the U. S. Pharmacopœia, under the authority of the National Convention which met for that purpose, in May last, in Washington City.—Ed. Am. Jour. Ph.

This is certainly an important step in medical progress, and one that intimately concerns all the apothecaries and medical practitioners throughout the world who speak and write the English language. Let us cherish the hope that the British work will be issued before the completion of the revision of our National Pharmacopœia, which is again to be published in 1860; so that we may avail ourselves of the labors of our British brethren.

IODIDE OF PROPYLAMINE.

By Benjamin J. Crew.

While the base Propylamine and its chloride are being investigated medicinally in this country, in order to verify or disprove the accounts received from Europe in relation to their asserted remedial powers in the cure of rheumatism, it occurred to the writer that a combination, of this new remedy with iodine, in the form of an *Iodide of Propylamine* might possess some valuable medicinal properties in the same disease in which iodine either simply or in some of its combinations has been long employed especially, in chronic cases attended with nodular swelling. Propylamine combines readily with the aid of a gentle heat with iodine, and forms a colorless solution, in which the characteristic odor of each of these substances can be perceived. It may be prepared by adding iodine to a convenient quantity of Propylamine in a glass flask over a sand bath as long as the iodine is taken up; a deep red solution is first formed, which as the combination is effected becomes gradually colorless; in case of an excess of iodine, a small addition of Propylamine will speedily take it up. Its odor, as before observed, is a combination; in taste it is saline, resembling closely iodide of potassium, and behaves with reagents like this salt, giving the usual characteristic precipitates with acetate of lead, nitrate of silver, &c. It is decomposed by acids, liberating free iodine, which colors the solution red; with concentrated oil of vitriol the violet vapors of iodine are evolved and crystallize on the sides of the test tube. It is alkaline to test paper, but upon exposure, it changes and gives an acid reaction. I have not been able to procure the crystals in any appreciable quantity, as upon concentration the Propylamine is volatilized, and the solution becomes red from free iodine.

Not having seen any account of this preparation, it may be proper to suggest a formula for its employment, should it be deemed worthy of examination and trial; and being in a liquid form, a formula similar to one published some time since in this Journal for the use of Propylamine is proposed.

℞. Iodide of Propylamine,	25 drops.
Peppermint Water,	6 f.oz.
Sugar,	2 dr.

DOSE.—A tablespoonful every two hours.

In this form the patient would receive the $\frac{1}{16}$ gr. of Iodine at a dose.

Philadelphia, 7th month, 1860.

NOTE ON FLUID EXTRACT OF WILD CHERRY BARK.

By William Procter, Jr.

The recipe for this preparation, published at page 108, vol. 28th, (1856,) has been received with such general favor that it may be looked upon as an established formula, and probably is, in substance, the one to be adopted in the revised edition of the United States Pharmacopœia. In a paper on fluid extracts read before the American Pharmaceutical Association, last year, and published in the November (1859) number of this Journal, I included a process for this fluid extract of double the original strength, so as to be in the proportion of an ounce to the fluid ounce in accordance with the general strength adopted in that paper;—but at the same time it was doubted whether the bark could be properly extracted and condensed in so small a bulk without the loss of a portion of its valuable qualities. As the strength of eight ounces to the pint gives the dose a teaspoonful, the Committee of the College of Physicians of Philadelphia adopted the formula as originally proposed, in preference to the stronger preparation.

The object of this note is to offer a few hints in regard to the details of the process, which have been suggested by considerable practical experience with the manipulations required.

Wild cherry bark contains amygdalin, a bitter principle not yet isolated, tannic acid, resin and fixed oil, besides other less important matters. It is desirable to get all the amygdalin and the bitter principle and a part of the tannic acid in the fluid extract, whilst the remainder of the tannic acid and all of the resin and fixed oil should be excluded. In order to render these comments intelligible to the reader who may not have the volume for 1856 at hand, I will recapitulate an outline of the formula, with the quantities altered for a gallon of the fluid extract.

Take of	Wild Cherry Bark (Cerasus serotina)	64	ounces Troy.
	Sweet almonds,	8	" "
	Granulated Sugar, (pure),	96	" "
	Alcohol (U. S. P.,)		
	Water, each a sufficient quantity.		

Macerate the bark (powdered and passed through a No. 60 seive) moistened with two pints of alcohol, for two hours, pack it firmly in a cylindrical percolater, and gradually pour on alcohol until twelve pints have slowly passed. If the powder has not been carefully prepared as directed, the passage of the liquid must be regulated by a cork or stop cock. The tincture is then poured in a still, and ten pints of alcohol drawn over by distillation, the residue is evaporated to a syrupy consistence, and, while hot, mixed with two pints of cold water. Separate the resinous and oily matter which precipitates, and evaporate the liquid again till all traces of alcohol are removed. The almonds, without blanching, are now to be thoroughly beaten, with a little water, until reduced to a smooth paste. (This part of the operation is most effectually performed in an iron mortar with a flat-faced pestle.) They are then rubbed down with sufficient water to make the emulsion measure four pints, without straining it. This is then incorporated with the syrupy extract of the bark in a bottle, securely closed, and agitated from time to time for twenty-four hours, at least, and unless the weather is very warm forty-eight hours will be better, as on prolonged contact of the almonds with the amygdalin of the bark, depends the development of the hydrocyanic acid and volatile oil. The liquor is now thrown on a cloth, rapidly and forcibly expressed, to remove the solid residue, which is reserved, and the liquor filtered through paper into a gallon bottle containing sugar. If the liquid, thus obtained, is not sufficient to dissolve the sugar by agitation and make the measure of a gallon, pour water on the dregs in the cloth, express and filter until sufficient liquid is obtained to make that measure, and strain. The most annoying part of this process is frequently experienced in the extreme slowness with which the liquid passes the filter (owing to the fixed oil and fine particles of the almond paste,) and the consequent tendency to loss of strength by the prolonged exposure. After many experiments, with gelatin, etc., and various filters, I have found the most satisfaction from the following plan: For the quantities mentioned take half a pound of prepared chalk, triturate it in a mortar with some of the turbid liquid, add it to the remainder, and shake the mixture well several times. It may now be poured at once on a muslin filter supported in a large funnel with ribs, when the liquid, which at first is cloudy, soon becomes transparent and passes with considerable facility. When the liquid ceases to pass, pour on water carefully to displace the portion retained in the chalky sediment. The chalk in no respect injures the preparation, having no reaction with any of the principles present that are medicinally important.

ANALYSIS OF MILK.

By Jno. M. Maisch.

It is conceded by all who live in our large cities, that a vast quantity of poor, diluted or adulterated milk is consumed therein. I have lately had occasion to examine a specimen, left with me by a milk dealer, to whom it was delivered by a farmer as pure and fresh country milk. The appearance of it already excited suspicion, it looked rather bluish and was decidedly "thin" when tasted. It was neutral to litmus and turmeric, and did not effervesce with acids.

Tested with the lactometer, it showed at 60° rather more than one-half water. To obtain certainty on this point, the caseine was collected from 2000 grs. of this milk; after washing with ether and drying it carefully, it weighed 86 grs., making 4·3 per ct. According to Knobloch, good summer milk contains between 8·40 and 8·67 per ct. together with the insoluble salts, (see Lehman's Physiol. Chemistry). The butter obtained from the ethereal solution weighed 20 grs. or one per cent; there was, however, a little butter floating on the surface which could not be mixed with the milk by agitation and had therefore to be neglected. Good milk contains between 3.13 and 5.10, an average of about 4.25 per. ct.

There is no doubt but this milk contained one half its measure of water; but from the small amount of butter, it may be possible that it was manufactured from fresh milk and skimmed milk each one part, and water two parts.

I have examined it for chalk and magnesia, but found it free from both.

Philadelphia, August, 1860.

ON THE IMPURITIES OF COMMERCIAL ZINC,

With special reference to the residue insoluble in diluted acids, to sulphur, and to arsenic.

By Charles W. Eliot and Frank H. Storer.

The above is the title of a valuable paper read before the American Academy of Arts and Sciences, May 29th, 1860, and published in vol. viii. new series, of its memoirs, of which it occupies forty pages quarto. The importance of pure zinc in chemical, and especially in medico-legal researches, has been a prompting motive with the authors in their work.

In order to make the results as general as possible, the authors obtained authentic specimens of zinc from the following sources, viz:

1. Silesian zinc.
2. Vieille Montagne (Belgium) zinc.
3. New Jersey (American) zinc.
4. Pennsylvania zinc, (Pennsylvania and Lehigh zinc works. Bethlehem, Pa.)
5. Vieille Montagne zinc, such as is used in the U. S. Mint.
6. A zinc labelled "Zinc pur," Rousseau Frères, Paris.
7. A sheet zinc of unknown origin obtained at Berlin (Prussia.)
8. An English zinc, made near Wrexham, North Wales.
9. An English zinc from the Mines Royal, Neath, Glamorganshire.
10. An English zinc from the works of Dillwyn & Co., Swansea.
11. An English zinc from the works of Messrs. Vivian. Swansea.

A qualitative examination of the residue left by these zincs, when treated with dilute acids, showed that they consisted chiefly of *metallic lead*. In fact the authors have arrived at the conclusion, that lead is the chief impurity in commercial zinc, and that carbon, tin, copper, iron, arsenic and other impurities found in it by previous observers, occur either in very minute quantities, or rarely and doubtless accidentally.

Lead.—The authors found the following percentages of metallic lead, estimated as sulphate, using diluted SO_3 saturated with sulphate of lead, as the solvent of the zinc, and treating the insoluble residue with diluted NO_5 and washing it well.

Names of Zinc.	Wt. of Zinc taken.		Wt. of Lead obtained.	Percent. of lead.
1. Silesian,	23.8066	grammes.	0.3472	1.460
2. Vieille Montagne,	25.2795	"	0.0738	0.292
3. New Jersey,	28.672	"	0.0225	0.079
4. Pennsylvania,*	26.522	"	0.0000	0.000
5. U. S. Mint,	24.5308	"	0.1212	0.449
6. Rousseau Frères,	24.3432	"	0.0259	0.106
7. Berlin,	23.074	"	0.2990	1.297
8. Wrexham,	29.999	"	0.3569	1.192
9. Mines Royal,	38.8276	"	0.3197	0.823
10. Dillwyn & Co.,	31.6425	"	0.5256	1.661
11. Messrs. Vivian,	27.724	"	0.4203	1.516

The authors carefully verified their processes for estimating the lead by determining the SO_3 in each specimen of sulphate; and also answered the question, whether the use of diluted SO_3 saturated with sulphate of lead would introduce lead into the result, satisfactorily in the negative.

Cadmium and Tin.—The filtrates from the precipitates of sulphate of lead of the several zincs enumerated above, except that from Pennsylvania, were saturated with sulphuretted hydrogen for twenty-four hours or upwards, and the small precipitates which separated were filtered off, washed quickly with sulphuretted hydrogen water, dried and ignited; they were then treated with a few drops of nitric acid, again evaporated to dryness, ignited and weighed. The color of these precipitates was yellowish brown, except that from New Jersey zinc, which was blackish, owing to the copper it contained as afterwards ascertained. The authors determined the absence of arsenic and antimony, and the precipitates were therefore the oxides of tin or cadmium, or both. The amounts of these precipitates from the same weights of zinc, as in the table above, and in the same order, omitting the Pennsylvania zinc, are as follows: The numbers giving the amount of the precipitates per cent. of the zinc treated.

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* This Zinc gave no residue.

No. 1.	0.0564	No. 7.	0.0178
No. 2.	0.0281	No. 8.	0.0070
No. 3.	0.4471	No. 9.	0.0041
No. 5.	0.0098	No. 10.	0.0035
No. 6.	0.0406	No. 11.	0.0285

Of these samples, numbers 1, 5, 6, 8, 9 and 10, contained none or but faint traces of tin, whilst the others gave distinct spangles of tin by the blow-pipe test.

Copper.—None of the specimens, but that from New Jersey, gave the slightest evidence of the presence of copper, and that was found to contain 0.1298 per cent. of that metal.

Iron.—The authors examined three of the samples for this metal, but did not feel it needful to push them further, as published experiments already show that its proportion rarely exceeds two-tenths of one per cent. They found 0.2088 per cent. in the New Jersey zinc; 0.0586 in the mint zinc; and 0.674 in the Berlin (sheet) zinc.

Carbon.—The authors after some carefully conducted experiments, have arrived at the conclusion that carbon is much more rarely a constituent of commercial zinc than has been frequently believed, as their very accurate experiments gave hardly a trace of evidence in favor of its presence.

Sulphur.—The authors found sulphur present in each of the specimens enumerated by adding ten or fifteen grammes of each zinc to a mixture of chloride of calcium and pure muriatic contained in a small flask, the neck of which contained paper moistened with alkaline acetate of lead. Every precaution was taken to avoid sulphur in the agents used, as described at length, in the authors' memoir.

Arsenic.—The authors have very thoroughly investigated the subject of arsenic as an ingredient of commercial zinc, and to assure themselves of the accuracy of their experiments have investigated the American acids with a view to the same impurity. The authors believe that the general opinion that arsenic is a very common impurity in commercial zinc may be traced to Proust, who, with others, long before the discovery of cadmium in 1817, most probably confounded the sulphides of these metals, the latter of which being a common admixture. The delicate indications of Marsh's apparatus, which so easily detects arsenic in zinc, when present, added to this belief before attention was turned to the contamination of acids by the same metal, and there is reason to believe, at times, that this has been the source of the metal when it has been attributed to the zinc.

"The conclusions at which we have arrived, after a long course of experiments with many different zincs, and various acids, are these:—first, that much of the zinc of commerce is free from arsenic, or at least contains no arsenic that can be detected by the most delicate tests for that metal; secondly, that the sulphuric and chlorohydric acids found in commerce do very often contain arsenic, and are always so liable to contain it as to be utterly unfit for use in Marsh's process without special purification for that purpose. The steps by which we are led to these results, and the evidence on which they are founded, we proceed to describe. We have used exclusively Marsh's process for the detection of arsenic, applied with the apparatus and with all the precautions recommended by Otto.* Our apparatus consisted of a flask provided with a funnel tube, and a tube bent at right angles, with which were connected by connectors of sheet india rubber, first, a tube of the form of a chloride of calcium tube, filled with asbestos; secondly, a similar tube filled with pumice stone soaked in caustic potassa; and thirdly, one filled with chloride of calcium. Through these three tubes, in the order in which they are named, the gas generated in the flask was obliged to pass before it arrived at the reduction tube, which was of hard German glass, and about one centimetre in diameter. The reduction tube was drawn down to a fine bore, and during the progress of an experiment was heated by one of Bunsen's triple gas-burners. To prevent any elevation of the temperature in the flask during an experiment, it was immersed in cold water, and the dilute acid used was always cold and added in small quantities. With this apparatus, (which for convenience we shall designate as Otto's apparatus), taking every possible precaution to insure its perfect cleanness, we made several experiments upon Silesian zinc. Two hundred grammes of this spelter, carefully granulated, were used in each experiment, and the sulphuric acid employed was a commercial acid made in this country from Sicily sulphur. We were not unaware of the fact that arsenic is almost invariably found in the foreign sulphuric acid made from various impure sulphurs of unknown origin, or from pyrites; but it is a common impression that the American acid manufactured directly from Sicily sulphur is free from arsenic. Positive statements to this effect have been made by chemists who have had mainly in view the common use of sulphuric acid in the preparation of chemical compounds used in Pharmacy, and the assertion has enough plausibility to command ready and general belief. Using such acid and two hundred grammes of Silesian zinc, we obtained at the end of an hour, during which the reduction tube was heated, a deposit of arsenic perfectly distinct, though not bright enough to be called a mirror. Our next experiment was made with the same acid upon two hundred grammes of a sample of Vieille Montagne zinc, perfectly clean and carefully granulated. At the end of the hour during which the gas was passed through the reduction tube, a brownish, volatile coating was found in that part of the tube where the bore was smallest. These experiments on Silesian and Vieille Montagne zinc were several times repeated and always with the same result; the deposit in the reduction tube was often too thin and slight to be positively identified as arsenic: but it could not be distinguished from the deposit of that metal and would have been perfectly fatal in a medico-legal investigation, or in any case in which absolute purity of the materials was desired. Not convinced that the zincs were the source of the arsenic, we desired to prepare a quantity of sulphuric acid in which the presence of arsenic could not possibly be suspected. To attain this object we subjected a specimen of American sulphuric acid to the following process: The acid was first boiled with a little flowers of sulphur, as proposed by Barreul, in order to free it from the nitrous fumes which the common sulphuric acid almost always contains; a small quantity of pure chlorohydric acid was then stirred into the cooled acid, which had been carefully decanted from the free sulphur, and the whole again boiled; to the acid again cooled, a second addition of chlorohydric acid was made, and again the acid was heated till dense white fumes had been escaping for upwards of half an hour. During this process the volatile chloride of arsenic is completely driven off, the second addition of chlorohydric acid being made, as has been recommended by H. Rose, in order to insure this result. Lastly, a portion of chlorine-water was added to the cooled acid to oxidize any sulphurous acid which might be contained in it; and after a third boiling, the acid, cooled and diluted with three parts of water, was ready for use. This method of purifying sulphuric acid is a combination and modification of several well known processes." "With the acid thus prepared, we tested two hundred grammes of Vieille Montagne zinc, and after passing, during more than an hour, a continuous gentle stream of gas through a reduction tube, of which about four centimetres were maintained at a bright red heat, we found that there was absolutely no deposit whatever in the cool and narrow part of the reduction tube. With the same acid and apparatus, two hundred grammes of Pennsylvania zinc (which has proved to be altogether the purest zinc in our possession) gave absolutely no deposit of any kind in the fine reduction tube at the end of one hour, the time during which, in all our examinations for arsenic, we maintained a steady flow of hydrogen through the red hot reduction tube." "In order to satisfactorily establish these conclusions it was necessary to prove by frequent repetition, that the same result might always be expected from these two zincs, and that their freedom from arsenic was a property shared by the whole sample, and not an accidental peculiarity of a particular fragment. At sundry times we therefore repeated again and again the long and careful test for arsenic above described with these two samples of spelter, and invariably arrived at the same conclusion; namely, that no deposit of any kind could be obtained in the reduction tube from these zincs and purified sulphuric acid."

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* Manuel of the Detection of Poisons. New York, Bailliere, 1857.

The authors, by adding infinitessimal quantities of arsenious acid to these zinc and acid mixtures, say that they could easily detect a proportion of arsenic less than the ten millionth part of the zinc used.

The authors subsequently applied the test to the other zincs of the list, and all of them, including the New Jersey zinc, were found to contain various minute quantities of arsenic. The authors finally remarked that the purest of all the zincs they have analyzed, is that manufactured at the Pennsylvania and Lehigh zinc works, Bethlehem, Pa. This spelter dissolves in dilute sulphuric acid without leaving any appreciable residue, and therefore contains no lead; indeed, a trace of cadmium is the only impurity, whose presence in the zinc we could confidently assert. The ore from which this spelter is made is the hydrated silicate of zinc (electric calamine)and it is not surprising that this mineral should yield zinc of singular purity, if the ore be carefully selected. We have stated above, that our first sample of this zinc was free from arsenic, but a second sample was not pure in this respect. At these works the oxide of zinc is manufactured as well as the metal, and we learn from a letter addressed to Prof. Brush, by Mr. Wharton, the director of the works, that the crust from the oxide furnaces has now and then been worked into spelter, and that the ore used in making the oxide is less carefully selected than that which goes to the spelter furnaces, and is much more likely than the latter to contain both blende and pyrites. This fact may account for the occurrence of arsenic in some specimens of this spelter while the greater, part of it, manufactured from carefully selected silicate of zinc, is perfectly free from that impurity. There seems to be no reason why zinc of uniform purity should not be obtained from this excellent ore.

TARTRO-CITRIC LEMONADE.

(*Liquor Sodæ Tartras.*)

By Prof. J. Lawrence Smith.

There is nothing new in the use of tartrate of soda as a purgative, and it is only surprising, that once known, it ever gave place to the citrate of magnesia, to which there are several objections well known to practitioners. Among these I would enumerate the not unfrequent irregularity of its operation, sometimes not acting as promptly as desired, at other times with too great and continued energy, requiring anodynes to arrest its operation. Again, owing to the manner in which it is made, and the want of uniformity in the composition of the commercial carbonate and calcined magnesia, the amount of free acid in the solution varies much, when made at different times by different operators, and with different lots of materials. There being sometimes two or three drachms of free acid present in a bottle, and besides, under all circumstances, the mixture must be quite acid in order to retain for any length of time the citrate of magnesia in solution. Mitscherlich and Bence Jones have both made experiments on citric acid, and they consider it a poison analogous to oxalic acid.

Yet another objection to citrate of magnesia is the certainty of its undergoing decomposition, resulting in the deposition of an insoluble citrate of magnesia, a change that takes place very rapidly when the bottle is opened.

With these facts before me, I compounded a preparation of tartrate of soda with lemon syrup and water, (at first I introduced a small portion of citric acid, calling the mixture Tartro-Citric Lemonade.)

It is free from the objections of the citrate of magnesia, is a prompt and certain purgative, without excessive action, and uniform in composition, does not undergo decomposition even after the bottle is opened, even more agreeable to the taste and less costly than citrate of magnesia. It was first manufactured by T. E. Jenkins & Co., and is now also manufactured to a large extent at the Louisville Chemical Works.

The formula adopted by Messrs. T. E. Jenkins & Co., at the Louisville Chemical Works, which is under my direction, is

Sal Soda,		21 lbs. 14 oz.	avoirdupois.
Tartaric acid,		15 lbs.	"
Sugar, (white)		24 lbs.	"
Water	to make	25 gals.	"

It is then put into strong twelve ounce bottles, and thirty-five grains of bicarbonate of soda added to each bottle, and immediately corked and fastened by twine or wire.

This preparation has been used in Louisville for about six years, and is gradually extending over various parts of the West and South. Wherever it has once got into use, it has never been abandoned, and the names of hundreds of physicians could be obtained, certifying to its utility and preference over the citrate of magnesia. I think that it would be well for our Pharmacopœia to adopt it.

CALIFORNIA BEER, OR YEAST PLANT.

By the Editor.

A correspondent in North Carolina has forwarded to us a small vial of a yellowish opaque fluid, which he states is the so-called "California beer" plant. Since then we have received a small package of a translucent gum-like matter, labelled "California Beer Plant," from Wm. H. Bassett, of California. The Southern Medical Journals have had several communications in them referring to certain deleterious results, and even death, from the use of this "beer" in bread making, which appear to be unfounded. Dr. W. H. Bowling, the Editor of the Nashville Journal of Medicine and Surgery, (see that Journal, May, 1860,) thinks that it is identical with *Torula cerevisiæ*, the common yeast plant, or if not identical, closely allied to it. He says, "Let us put now this California yeast under the microscope, and we will find the same thing—a number of oval cells, containing granules, and multiplied by budding in a manner similar to that of yeast, and like it, only somewhat smaller, as far as we have seen. The plant has probably the same origin as the yeast plant, but what that is is a mystery," &c. Dr. Leidy, to whom a portion of this specimen was submitted, finds it to be the same plant as in ordinary yeast. We confess to being quite ignorant of the history of the so-called "California beer" plant, as none of our correspondents have referred to its origin. The Pacific Medical Journal for May repudiates the idea of its possessing any deleterious properties. Cannot some of our friends give the history of this substance?

HYPOPHOSPHITE OF QUINIA.

By J. Lawrence Smith, M. D.

Professor of Chemistry, University of Louisville.

I brought this article to public notice a short time ago, through the pages of this Journal. As I was not then prepared to give a statement of its composition, that omission will now be made up.

In 100 parts there is

Quinine,	83.00
Hypophosphorous acid,	10 09
Water of combination,	2 30
Water of crystallization,	4.60

Giving the formula: $C^{40}H^{24}N^{2}O^{4},PO,HO+2$ aq.; or, according to Gerhardt's method of statement, just double that formula. Its physical characters have been fully described.

The manner in which it is manufactured at the Louisville Chemical Works is as follows:—50 ounces of sulphate of quinine is placed in a large porcelain capsule; to this is added 2 gallons of distilled water, and 2 ounces of hypophosphorous acid. Warm up to about 200° F., and make a perfect magma of the sulphate of quinine and water, then add a solution of hypophosphite of baryta until a perfect decomposition is produced. Great care must be taken to have no excess of baryta salt; better have a slight excess of sulphate of quinine. But a little skill will enable a competent operator to obtain an exact neutralization. While warm, the solution of hypophosphite of quinine is filtered off from the sulphate of baryta and allowed to crystallize. The sulphate of baryta is then washed, and the washings added to the mother water of the first crystallization, and evaporated with great care, when other crystals may be obtained. If not carefully evaporated, it will become colored. The crystals are drained and dried on a cloth stretcher.

Louisville, (Ky.,) Aug. 20th, 1860.

LETTER TO THE EDITOR ON THE BOTANICAL SOURCE OF BALSAM OF PERU.

By Daniel Hanbury, F. L. S.

London, August 2d, 1860.
Plough Court, Lombard Street.

My dear Sir,—I am extremely obliged to you for sending me that portion of the last number of the *American Journal of Pharmacy* which contains the two communications on the Balsam of Peru. The subject is one which I have long studied, and in which I have taken much interest, especially since the death of my old preceptor, Dr. Pereira.

Dr. Carson's paper is valuable from containing a figure (the first that has been published) of the flowers of the Balsam of Peru tree;—but on the other hand I am concerned to think the author has not had access to some direct information on the subject. Since Pereira's paper was published, we have learnt much from other sources respecting the botany of *Myrospermum* and *Myroxylon.* The *Myrospermum* of Sonsonaté, (Pereira in *Pharm. Journal,* Dec. 1850,) has been admitted a distinct species, and described as such by Royle, under the name of *M. Pereira* (Royle, *Manual of Mat. Med.*, ed. 2, 1853, p. 414.)

In addition to this, Dr. Klotzsch, of Berlin, has published in the *Bonplandia,* 15th Sept., 1857, an elaborate enumeration of all the species of *Myroxylon* and *Myrospermum*—the former 8 in number, the latter 3. Royle's species is transferred to the genus *Myroxylon*, under the name of *M. Pereira*, Kl., and maintained by Dr. Klotzsch as quite distinct from *M. peruiferum*, Mutis et Linn. fil. As my own herbarium includes small specimens of all the species enumerated by Dr. Klotzsch, and I have carefully examined the specimens that are contained in the herbaria of Kew, the British Museum, and the Jardin des Plantes in Paris, I may be allowed to offer an opinion in confirmation of Dr. K's. view, that these species are distinct. At the same time I must express the opinion that several of Dr. Klotzsch's species are founded on very inadequate materials, and that much remains to be done before we arrive at a satisfactory knowledge of the plants in question.

I hope Dr. Carson will continue in communication with Dr.

Dorat, and induce him to obtain still further information respecting the manufacture of the so-called *Balsam of Peru*, as well as additional specimens of the tree. With this view, I am writing him a few lines by this mail.

Believe me to remain, my dear sir,
Yours, very sincerely,
DANL. HANBURY.

ON RED PRECIPITATE OINTMENT.

BY F. A. KEFFER.

To the Editor of the American Journal of Pharmacy:

SIR,—Being aware of the great difficulty in keeping, especially in warm weather, the Ung. Hydrargyri Oxidi Rubri, I have been lead to make some experiments with the same, and find that, instead of using lard, if I use Oleum Ricini, that the preparation will keep perfectly well for a great length of time. I have now in my possession a sample that has been made over two years, and it is perfectly free from rancidity, and still retains its original color, the mercury to all appearance not having become deoxidized in the least. My formula is

℞. Olei Ricini, . . .	℥ iiiss.
Ceræ Albæ, . . .	℥ ss.
Hydr. Oxidi Rubri, . .	℥ ss.

Melt the wax and oil with a gentle heat, and when cool rub in the red precipitate previously reduced to fine powder.

Hoping the publication of this will be of some advantage to Pharmaceutists, I remain yours, &c.,
FRED. A. KEFFER.

Philada., July, 1860.

THE POISON-OAK AND ITS ANTIDOTE.

BY COLBERT A. CANFIELD, M. D.

In the woods and thickets of California, as well as on the dry hill-sides, and in fact in every variety of locality, may be found a very venomous shrub,—the "poison-oak" or "poison-ivy;" the *hiedra* of the Spanish people—the dread of all those who are acquainted with it.

This plant is known scientifically as follows:—it belongs to the natural order *Anacardiaceæ* and is called *Rhus diversiloba* by Torrey and Gray, *Rhus lobata* by Hooker, and *Rhus toxicodendron* by Hooker and Arnott. It is very similar to the poison-ivy of the Atlantic States, (*R. toxicodendron*, Linnæus), both in its appearance and in its poisonous qualities. But it is unnecessary for me to describe it, even popularly; for it is unhappily too familiar to all; and I will only remark that, although generally a small shrub, the trunk sometimes attains the diameter of six inches, and the whole plant climbs over some large tree for support. The finest specimens that I have ever seen were in an oak and laurel grove on the road south of San Jose.

I do not need to describe the cutaneous disease that is produced by contact with or approach to the poison-oak. And it is hardly necessary to advert to the fact that this poison is the cause of a vast deal of misery and suffering in California; and that there is scarcely ever a time in any little town or neighborhood when there are not one or more persons suffering from it; and I venture the assertion that there are in this State constantly from five hundred to a thousand persons afflicted with this disease.

Farmers and laborers are especially liable to this poisoning; and besides the suffering and annoyance caused by it, the loss of valuable time is no small item to be taken into the account. Truly he who makes known a prompt and sure antidote to this poison will be a public benefactor; and this communication is made to the public with the confident expectation that the remedy here described will prove to be such benefaction.

The remedies in use for the effects of the poison-oak are quite various, and some of them will cure the milder cases. Of all the common remedies, the warm solution of the sugar of lead has within my experience been productive of the best results. The water of ammonia, warm vinegar and water, the warm decoction of the leaves of *Rhamnus oleiflious* ("Yerba del Oso," of the Californian Spanish,) or even pure warm water, are sufficient sometimes to produce a cure. All these remedies are, of course applied externally by way of washes to the parts affected.

But the only remedy that I have found *invariably* successful as an antidote for this poison is an indigenous plant growing very abundantly in this vicinity and in other parts of the State. It is a tall, stout perennial; belongs to the Composite family, and looks like a small sun-flower. It is from one to three feet high; has bright yellow flowers in heads one to two inches in diameter, (and as I have said) like small sunflowers, flowering from June to October. Before flowering, the unexpanded heads or buds secrete a quantity of resinous matter, white and sticky—like balsam, that is finally, after the flower expands, distributed over the petals, &c., of the flower like varnish. The whole plant, flowers, leaves and all, is resinous and viscid. When it grows in dry hills, it is stiff and rigid, with narrow, thin leaves; but in damp localities it is more robust and succulent, with wide, fleshy leaves.* Its botanical name is *Grindelia hirsutula and G. robusta;* but I have not been able to find more than one species, and all the different forms possess the same remedial virtues.

The mode of using it is as follows: one may bruise the fresh herb and apply it by rubbing over the parts affected; or boiling it in a covered vessel, make a strong decoction of the fresh or dried herb, with which to wash the poisoned surfaces. Its remedial properties appear to be contained chiefly in the resin or balsam-like juice of the plant, which is particularly abundant on the surface. One application is sometimes sufficient for a cure; but if the disease has been of long duration, several days will elapse before relief is obtained.

The plant is a remedy for the poison-oak used originally by the Indians of this vicinity, and by them its virtues have been communicated to the Spanish Californian people who are now commencing to use it.

I became acquainted with it in the following manner: A lady acquaintance of mine was poisoned in early youth by the poison-oak, and there resulted a cutaneous affection similar to "salt-rheum,"—fiery, burning, insupportable—that would not yield to remedies or the skill of good physicians. She underwent cauterization and blistering; she took mercury and other powerful remedies, iodine, sarsaparilla—all to no purpose. Her hands were covered with deep ulcers, and her wrists and arms with an eruption that tormented her day and night. Nothing relieved her. She married in the mean-time, and had a family of fine, healthy children, but she did not get rid of her affliction. At length, she believing that the disease was not "salt-rheum" nor anything more or less than the effects of poison-oak, was induced to use the remedy that I have described; and a very few applications were sufficient to heal up the ulcers and cure her entirely. She has never been troubled with any cutaneous eruption since that time, although several years have now elapsed.

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* The MS. sent to the printer is as follows; "Its botanical name is *Grindelia hirsutula*, of Hook and Arnott; and it belongs to the natural order *Compositæ;* of the two for msmentioned above, the botanists have made two species, *Grindelia hirsutula* and *S. robusta:* but I have not," &c.

Her account of her case induced me to use the plant, which I have done frequently since with the happiest effects. One gentleman of my acquaintance, who is very susceptible to the poison-oak, was poisoned on the face, hands, etc., and the disease did not yield to sugar of lead, hartshorn, warm lotions or any other of the commonly used remedies. But a few applications of the docoction of Grindelia removed it entirely. It is said that when Fremont was here with his soldiers they camped on the flat below the town among the poison-oak, and many of his men were badly poisoned. The trouble in many cases did not yield to the prescriptions of the physicians, and it was relieved only by using this remedy. But aside from rumor or hearsay I am cognizant of six cases in which the effects of poison-oak have yielded to the Grindelia when other remedies have failed. Now it cannot be said that the effects of the Grindelia, as stated above, were imaginary, or those cures accidental: for the disease produced by the poison-oak is specific and *sui generis*, a cutaneous disease palpable and severe, that is produced by a specific vegetable poison, and hence does not at all (as may be said of many other diseases,) depend upon the imagination or moral state of the patient either for its cause or cure.

It may not be amiss to say in conclusion, that the Grindelia is used also by the people of this country as a remedy for other cutaneous diseases that are characterised by heat and itching; such as nettle-rash, salt-rheum, etc., but I have no means ot knowing its effects in these diseases.

Monterey, *Oct.* 10, 1859. *Pacific Sentinel.*

EXPLOSIVE PROPERTIES OF OXALATE OF PEROXIDE OF MERCURY.

By Peter Hart.

Having two days ago prepared a small quantity of oxalate of mercury, I allowed it to remain on the sand-bath drying until this morning, when it exploded with great violence, breaking the basin and dispersing the fragments so effectually, that not more than three or four pieces have been found, and these do not exceed in size half a finger nail.

I was absent at the time of the occurrence, but have had the relation of the circumstance from my father, who, in fact was reaching out his hand to remove the basin at the moment the explosion occurred, having perceived signs of decomposition going forward, puffs of gas coupled with sharp crackings having for some seconds issued from it. Several of the fragments struck him in the face, but fortunately did him no serious injury.

When I arrived I found some half-dozen panes of glass situated about twenty feet distant from the basin, broken by flying fragments, one piece of apparatus was broken, evidently by the concussion, and the whole of the tables, even at the farthest point of the laboratory, were covered with sand projected from the bath.

I send you this account because it appears to me that this salt (oxalate of the *peroxide* of mercury) appears to be more explosive than the books would lead us to imagine. Gmelin says that it decomposes with a hissing noise. According to this author the mercurous oxalate appears to be more explosive than the mercuric; for speaking of the former salt, he says: "When suddenly heated in a glass tube it detonates." It is possible that a portion of the salt I prepared (which was not more in quantity than from 1 to 2 ounces) might have been reduced to mercurous oxalate, but whether that was the case or not, it certainly decomposed with more than a hissing noise.—*Druggists' Circular.*

ON THE DIETETIC AND MEDICINAL PROPERTIES OF ERYTHROXYLON COCA.

BY DR. MANTEGAZZA.

(Prize Essay. Pamphlet. Milan, 1859.)

The Erythroxylon Coca, a plant which grows in moist and woody regions on the eastern slopes of the Andes, is highly valued by the inhabitants of Peru, Chili, and Bolivia, not only as a medicine, but also as an article of food; and serves with them as a substitute for the tea, coffee, betel, tobacco, haschisch, and opium used by other nations. Its culture, upon which, since the time of Pizarro's conquest, much care has been bestowed, has recently increased to such a degree, that in the year 1856 the revenue of the Republic of Bolivia, from the sale of this herb, amounted to thirteen millions of francs—a very large sum, if compared with the small number of consumers (800,000.) According to the account of M. Pöppig and of other well-known travellers, the natives use the dried leaves of the coca-plant either by themselves or in combination with a highly-alkaline substance called *Llipta*, which is prepared from roasted potatoes and the ashes of different other plants; they masticate them like the Malays and the inhabitants of the Indian Archipelago do the calcined leaves of the clavica betle. The use of this masticatory, which is considered a great delicacy, is not, however, confined to the rich; on the contrary, it is particularly among the hard-working Indians that the coca enjoys a high reputation as a nutriment and restorative, and its use is considered absolutely essential for the endurance of fatigue and exertion, so that a laborer in making his contract has a view not only to wages, but to the amount of coca to be furnished. The Inca who lives at a height of seven to fifteen thousand feet above the level of the sea, and whose meagre fare consists principally of maize, some dried meat, and potatoes of bad quality, believes that he can sustain his strength solely by the use of coca; the porter who carries the mail, and accompanies the traveller over the roughest roads at the quick pace of the mule, invigorates and strengthens himself by chewing coca; the Indian who works half naked in the silver and quicksilver mines, looks upon this plant as an ambrosia capable of imparting new life, and of stimulating to new exertions. It is not surprising, under such circumstances, that this article should be very much abused, and that the evil of intemperance in the use of coca, known as coquear, should be quite as prevailing among the natives of those districts, as intemperance in the use of tobacco, alcoholic liquors, and opium is among other nations. They often intoxicate themselves for several weeks, hide in the deepest forests in order not to be disturbed in their enjoyment, and not rarely return home to their family suffering from delirium or decided idiocy.

The child and the feeble old man seize with equal eagerness the leaves of the wonderful herb, and find in it indemnification for all suffering and misery. Be it that the praised efficacy of the plant is merely the effect of fancy or tradition, or that the plant really contains a powerful principle unknown to science, the solution of this mystery is certainly a worthy theme for scientific inquiry, and the investigations of Dr. Mantegazza deserve, therefore, our full attention.

Dr. Mantegazza observed that the chewing of a drachm of the leaves of the coca increased salivation, giving at first a somewhat bitter, and afterwards an aromatic taste in the mouth, and a feeling of comfort in the stomach, as after a frugal meal eaten with a good appetite. After a second and third dose, a slight burning sensation in the mouth and pharynx, and an increase of thirst, were noticed; digestion seemed to be more rapidly performed, and the fæces lost their stercoraceous smell, the peculiar odor of the juice of the coca becoming perceptible in them. On using the coca for several days, the author observed on himself as well as on other individuals a circumscribed erythema, an eruption around the eyelids resembling pityriasis; from time to time a not unpleasont pricking and itching of the skin was felt. An infusion of the leaves, taken internally, was found to increase the frequency of the pulse in a considerable degree. In making observations on the frequency of the pulse, the author was very careful to consider all the conditions which might influence it; he found that the temperature of the air being the same, and the liquids being heated to an equal degree, an infusion of coca will increase the action of the heart four times its normal standard, while cocoa, tea, coffee and warm water only double it. By taking an infusion prepared from three drachms of the leaves, a feverish condition was produced, with increased heat of the skin, palpitation of the heart, seeing of flashes, headache, and vertigo; the pulse rose from seventy to one hundred and thirty-four. A peculiar roaring noise in the ear, a desire to run about at large, and an apparent enlargement of the intellectual horizon indicated that the specific influence upon the brain had commenced. A peculiar, hardly describable feeling of increased strength, agility, and impulse to exertion follows; it is the first symptom of the intoxication, which is, however, quite different from the exaltation produced by alcoholics. While the latter manifests itself by increased but irregular action of the muscles, the individual intoxicated by coca feels but a gradually augmented vigor, and a desire to spend this newly acquired strength in active labor. After some time the intellectual sphere participates in this general exaltation, while the sensibility seems to be hardly influenced; the effect is thus quite different from that produced by coffee, and resembles in some degree that of opium. Dr. Mantegazza could, in this excited condition, write with ease and regularity. After he had taken four drachms he was seized with the peculiar feeling of being isolated from the external world, and with an irresistible inclination to gymnastic exercise, so that he who in his normal condition carefully avoided the latter, jumped with ease upon the writing-table without breaking the lamp or other objects upon it. After this a state of torpidity came on, accompanied by a feeling of intense comfort—consciousness being all the time perfectly clear—and by an instinctive wish not to move a limb during the whole day, not even a finger. During this sensation sleep sets in, attended by odd and rapidly changing dreams; it may last a whole day without leaving a feeling of debility or indisposition of any kind. The author increased the dose to eighteen drachms in one day; his pulse rose in consequence of it to one hundred and thirty-four, and in the moment when delirium was most intense, he described his feelings to several of his colleagues, who observed him, in the following written words: "*Iddio é ingiusto perche ho fatto l'uomo incapace di poter vivere sempre cocheando*" (this is the expression for intoxication by coca.) "*Io preferiscta una vitta di* 10 *anni con coca che un di* 1,000,000 *secoli senza coca.*" After three hours of sleep, Dr. Mantegazza recovered completely from this intoxication, and could immediately follow his daily occupation without the least indisposition—on the contrary, even with unusual facility. He had abstained for forty hours without food of any kind, and the meals then taken were very well digested. From this fact, the author finds it explainable that the Indians employed as carriers of the mail are able to do without food for three or four days, provided they are sufficiently supplied with coca.

From these experiments, made repeatedly on himself, and on other individuals, Dr. Mantegazza draws the following conclusions:—

1. The leaves of the coca, chewed or taken in a weak infusion, have a stimulating effect upon the nerves of the stomach, and thereby facilitate digestion very much. 2. In a large dose coca increases the animal heat and augments the frequency of the pulse, and consequently of respiration. 3. In a medium dose, three to four drachms, it excites the nervous system in such a manner, that the movements of the muscles are made with greater ease—then it produces a calming effect. 4. Used in a large dose it causes delirium, halluciations, and finally congestion of the brain.

The most prominent property of coca, which is hardly to be found in any other remedy, consists in the exalting effect it produces, calling out the power of the organism without leaving afterwards any sign of debility. The coca is in this respect one of the most powerful nervines and analeptics. These experiments, as well as the circumstance that the natives have used the coca, from the earliest period as a remedy in dyspepsia, flatulency and colic, have induced Dr. Mantegazza, and several of his colleagues in South America and Europe, to employ the leaves of the coca in a variety of cases, partly as masticatory, partly in powder, as infusion, as alcoholico-aqueous extract in the dose of ten to fifteen grains in pills, and as a clyster. Dr. Mantegazza has used coca with most excellent results in dyspepsia, gastralgia, and entralgia; he employed it not less frequently in cases great of debility following typhus fever, scurvy, anæmic conditions, &c., and in hysteria and hypochondriasis, even if the latter had increased to weariness of life. The coca might also be employed with great benefit in mental diseases where some physicians prescribe opium. Of its sedative effect in spinal irritation, idiopathic convulsions, nervous erethism, the author has fully convinced himself. He proposes its use in the highest dose in cases of hydrophobia and tetanus. It is a popular opinion that the coca is a reliable aphrodisiac; the author has, however, observed only two cases in which a decided influence upon the sexual system was perceived.

Dr. Mantegazza, finally, recommends this remarkable plant, which could be easily introduced into trade, to the profession for further physiological and therapeutical experiments, and adds the full history of eighteen cases by which the medicinal virtues of the remedy are proved to satisfaction.—*London Pharm. Journ.*, June, 1860, *from Oesterreichische Zeitschrift für Praktische Heilkunde*, November 4, 1859.

BASSIA FLOWERS.

Few trees have economic applications so numerous and so important as the Bassia trees of India. The wood of *Bassia longifolia* L. is hard and durable; its bark and leaves are used by the natives in medicine. Of the fruit, ripe or unripe, the skin boiled to a jelly is eaten with salt and capsicum. The ripe kernels afford an oil which is employed for culinary purposes as well as for lamps, for soap-making, and in medicine. The flowers which are produced in immense quantity, are gathered as they drop to the ground, and eaten as good food, either raw or roasted or boiled to a jelly.

These valuable properties are shared to a great extent by *Bassia latifolia* Roxb., a closely allied species also abundant in India. The flowers of this species also serve as food to both man and animals. They are used likewise for the preparation of an alcoholic spirit which is obtained from them by distillation. "This flower," says Dr. Alexander Gibson, Government Conservator of Forests in Bombay, "is collected in the hot season by Bheels and others, from the forests, also from the planted trees which are most abundant in the opener parts of Guzerat and Rajwarra. The ripe flower has a sickly sweet taste, resembling manna. Being very deciduous, it is found in large quantity under the trees, every morning during the season. A single tree will afford from 200 to 400 pounds of the flowers. The seed affords a great quantity of concrete oil, used in the manufacture of soap. The forest or Bheel population also store great quantities of the dried flowers as a staple article of food; and hence in expeditions undertaken for the punishment or subjection of those tribes when unruly, their bassia-trees are threatened to be cut down by the invading force, and this threat most commonly ensures the submission of the tribes.

"In Guzerat and Rajpootna, every village has its spirit shop for the sale of the distilled liquor from the flowers; in the island of Caranja, opposite to Bombay, the government duty on the spirit distilled (chiefly from the flower) amounts to at least £60,000 per annum; I rather think that £80,000 is most generally the sum. The Parsis are the great distillers and sellers of it in all the country between Surat and Bombay; and they usually push their distilleries and shops into the heart of the forest, which lines the eastern border and hills of those countries. The spirit produced from the Bassia is, when carefully distilled, much like good Irish whiskey, having a strong, smoky, and rather fœtid flavor; this latter disappears with age. The fresh spirit is, owing to the quantity of aromatic or empyreumatic oil which it contains, very deleterious, and to the European troops stationed in Guzerat some thirty years ago, appeared to be quite as poisonous as the worst new rum of the West Indies. It excited immediate gastric irritation, and on this supervened the malarious fever so common in those countries."*

Under their Tamil name *Elloopa,* the flowers of *Bassia longifolia* L. have lately been imported into London, we presume as an experiment to ascertain if they can find here any useful applications. The sample we have examined consists of fleshy corollas, of a ferruginous brown color and moist appearance as if they had been preserved in sugar. They have a sweet taste, and an odor that reminds one of dried fruit. When steeped in water they regain their natural dimensions, and are then seen to be 5 or 6 tenths of an inch long by about 4 tenths broad, and to consist of a thick and fleshy gibbous tube, bordered with eight small, thin, broadly lanceolate petals. Attached to the interior of the tube, and almost sessile, are the stamens in a double row, numbering from 16 to 18.—D. H.

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*Note on the various Vegetable Substances used in India for the purpose of producing Intoxication. Hooker's Journ. of Bot., vol. v. (1853,) p. 90.

London Pharm. Journ., June, 1860.

TRANSFORMATION OF STARCH INTO DEXTRINE AND GLUCOSE.

M. Musculus believes (Comptes Rendus, t. l. p. 784,) that the formation of dextrine and glucose is rather the result of a decomposition of the amylaceous matter than the simple assimilation of water. His reasons for supposing so are: 1. That diastase has no action on dextrine. 2. That dextrine and glucose appear simultaneously when starch is acted on by diastase, and always in the same relation, *viz.* (1), equivalent of glucose and (2), equivalents of dextrine. 3. That dilute sulphuric acid acts at first in the same way as diastase, but differs in this, that the reaction continues after all the starch has disappeared, only more slowly. If glucose be formed from dextrine by the assimilation of water, it is difficult to understand why its formation should be more rapid while some unchanged starch remains in the liquor than when only dextrine remains: the contrary ought to be the case. 4. The simultaneous appearance of dextrine and glucose takes place with sulphuric acid as well as diastase, and the proportions are the same.

The practical conclusions which the author draws from the facts are: 1. That in the manufacture of glucose, if we regard the action as finished when the liquor is no longer blued by tincture of iodine, a large quantity of dextrine remains mixed with the sugar, and as dextrine does not ferment with yeast a great loss is caused to the consumer. The manufacturers ought therefore to employ a higher temperature, and leave the acid and starch a longer time in contact. 2. The great resistance which dextrine offers to the action of dilute sulphuric acid furnishes an easy means of estimating a mixture of cane sugar and dextrine. Boiling for a minute with the acid is sufficient to modify all the cane sugar, so as to render it fit for the cupro-potassic tartrate test, while the dextrine undergoes no change in the same time. If any starch were present at the same time it might be got rid of by diastase, which has no action either on the cane sugar or dextrine. 3. The action of diastase explains how it is that brewers are obliged to employ an enormous quantity of barley to obtain a beer with but little alcohol: two thirds of the starch pass into dextrine. 4. That in making spirit from malt there is an inevitable loss of two thirds.—*Chem. News*, *London*, *May* 19, 1860.

PREPARATION OF NICOTINA.

M. Debize (Moniteur Scientifique, p. 691,) prepares nicotina by placing a mixture of lime and powdered tobacco in a cylinder and passing through it a current of heated steam. The opposite end of the cylinder to that at which the steam enters is connected with a worm which condenses the steam and the products carried along with it, nicotina, ammonia, and some undefined bases. In order to separate the nicotina the liquid is neutralized with sulphuric acid and then concentrated by evaporation. When sufficiently concentrated it is treated with ammonia and ether, by which means an ethereal solution of nicotina is obtained which can be easily separated and the nicotina purified by rectification.—*Chem. News*, *London*, *May* 26, 1860.

THE MAGNESIAN LIGHT.

Magnesium is well known as the metallic bases of magnesia; it is much lighter than aluminium, as its specific gravity is only 1·74; it is of a silvery whiteness, undergoes no change in dry air, and is subject to but slow oxidation in a damp atmosphere, and that only quite superficially; it may be hammered, filed, and drawn into threads. At the beginning of the present century its properties were developed by Davy, and still more thoroughly by Bussy. To obtain it pure is an expensive process; and as no practical advantage could hitherto be made of it, no one had attempted to discover a cheaper method of getting it. It was reserved to Bunsen to perceive a new property in this metal, and to suggest a practical application of it. Magnesium takes fire at the temperature at which glass melts, and burns with a steady and extremely vivid flame. In some photochemical investigations by Bunsen and Roscoe, experiments were made to test the illuminating capacity of a magnesium thread, when Bunsen discovered that the splendor of the sun's disc was only 524 times as great as that of the thread. Bunsen also compared the magnesium flame with ordinary lights, and found that a burning thread of 0·297 millimetres diameter produces as much light as 74 stearine candles, of which five go to the pound. It is plain that it only needs a mechanical device to spin magnesium, when heated into the form of a thread, upon spools, from which they can be run off like the strips of paper in Morse's telegraphic apparatus, to render it of practical use. Such a magnesium lamp-wick would be far more simple and complete than the preparations for the use of the electric or the Drummond light. A spool with its thread, a clock-work to wind it off, with the spirit lamp, would be easily transportable. A rival, therefore, to the strong lights hitherto used is like to spring up in Bunsen's magnesium-lamp, in all those cases where the item of expense is likely to be slightly regarded; for example, in brilliant illuminations, light-houses, &c.; for extraordinary degrees of illumination may be obtained by burning several of these threads of large dimensions at once.—*Chem. News, London, June* 9, 1860, *from Engineer.*

ON A NEW METALLIC ELEMENT.

Von Kobell has discovered in euxenite, æschynite, and samarskite, and a tantalite from Tammela, a new metallic acid belonging to the same group with tantalic and niobic acids. To the new metal contained in this acid, the author has given the (not very well selected) name of *Dianium.* When dianic acid, as precipitated by ammonia from its solution in chlorhydric acid, is boiled with chlorhydric acid and metallic tin, a beautiful deep sapphire blue solution is produced, which remains blue after filtration. When tantalic acid, from the tantalite of

Kimeto, or niobic acid from Bodenmais, are treated in the same way, the solution becomes bluish; and on adding water, the color quickly vanishes, and the solution, on filtering, passes through colorless.

When dianic acid is boiled with chlorhydric acid and zinc, instead of with tin, the blue solution does not appear, the precipitated acid becomes blue, but filters colorless, and is decolorized by water without being sensibly dissolved. When equal quantities of dianic, tantalic, and hyponiobic acids are boiled with concentrated chlorhydric acid, upon a funnel of platinum-foil for three minutes, all three give yellowish milky liquids; if water be then added, the solution of dianic acid becomes perfectly clear, while the tantalic and hyponiobic acids remain undissolved.

When freshly precipitated dianic acid is heated to boiling with dilute sulphuric acid, the milky liquid poured into a glass, and grains of distilled zinc thrown in, the dianic acid in a few moments becomes smalt blue, even dark blue, and retains this color for some time on addition of water; but the liquid passes through the filter colorless. In this respect, dianic acid resembles hyponiobic acid, while tantalic acid, under the same circumstances becomes pale blue, and immediately loses this color on addition of water. In this manner, tantalic may be distinguished from dianic and hyponiobic acids. The relations of the three acids to chlorhydric acid and tin, and to sulphuric acid and zinc, are thus sufficient to distinguish them from each other.

Dianic acid appears to exist, though in a less pure state, in the tantalite from Greenland, in pyrochlore from the Ilmengebirg, and in the brown Wöhlerite—though the author had but small quantities of these minerals at his disposal. A small piece of black yttrotantalite, believed to be from Ytterby, gave the reaction of dianic acid. A second specimen, however, the specific gravity of which was found to be 5·55, contained tantalic acid.

Titanic acid is easily distinguished from the other acids of the same group, by boiling it with muriatic acid and tin, and diluting the solution with water. The blue color then passes to rose red, and the solution retains this color several days. When dianic acid is present, the blue color predominates, but after standing some hours the rose color of titanic acid appears.

The tantalite from Tammela, which Von Kobell terms dianite, has a specific gravity of 5·5—while the other tantalites vary in density from 7·06 to 7·5. The streak of dianite is dark grey, while that of the tantalites from Tammela is dark brown red. Before the blowpipe, dianite exhibits no sensible difference from the tantalite of Kimeto.

H. Rose, to whom Von Kobell sent a specimen of dianic acid for examination, considered it probable that the peculiar reactions of this substance might be due to the presence of tungstic acid. Von Kobell has, however, shown by special experiments, that this is not the case. In conclusion, the author recommends those who desire to repeat his experiments, to employ the same proportions of water, acid, etc., of which he himself made use, and for the details of which we must refer to the original paper. —*Silliman's Journal, from Bull. der Acad. der Wissenschaften*, March 10th, 1860, (Munich).

NOTE ON THE EXTENT TO WHICH MERCURY VOLATILIZES ALONG WITH THE VAPOR OF WATER AT 100° C.

By J. W. Mallet.

In Berzelius' Traité de Chimie it is stated that Stromeyer drew attention to the fact of the evaporation of mercury in considerable quantity at 60° to 80° C. with the vapor of water, the more volatile substance carrying with it the less volatile, as in the case of a solution of boracic acid when heated.

This fact does not seem to have been very generally noticed by the compilers of chemical text-books in treating of the history of mercury, though it was always stated that the metal is capable of volatilizing *to a very slight extent*, even when alone, at the common temperature of the atmosphere. Some doubt too would seem to have been thrown upon Stromeyer's observation by the experiments made, under peculiar conditions, by Fresenius, and reported by him in the appendix to his treatise on quantitative analysis. It was found that 6·4402 grm. of mercury, *covered* with a considerable quantity of water, and heated to the boiling point of the latter for a quarter of an hour, lost but ·0004 grm., while exposure to the air at summer heat for six days produced a further loss of ·0005 grm.

I have lately observed the tolerably rapid evaporation of the metal with steam, produced not from a mass of water covering the quicksilver, but from a porous and highly absorptive clay which was dry to the touch, but gave off some eight or ten per cent of water when heated to 100° C. A specimen of this soil had been in contact with mercury, and several grams. of the metal in small globules had become mixed up with the mass. It was placed in the common copper box with double sides which serves as a steam-bath, and exposed to the temperature of boiling water. In half an hour I was surprised to see that the little piece of glass tube through which the heated air and vapor from the inside of the steam-bath escapes was coated with a bright specular deposit of metallic mercury. This was brushed off, and the tube replaced, when again it became in a short time similarly coated. The steam-bath was kept in constant use in drying this and other specimens of soil for twenty or thirty hours, and in this time between four and five grains of mercury was collected from the glass tube. Doubtless the condensation of the mercury vapor on the latter must have been far from complete—a large proportion of mercury probably escaped into the atmosphere. At any rate it seems clear that the metal can volatilize in very considerable amount when surrounded by vapor of water at 100° C., and not at the same time pressed upon or affected by the cohesion of a mass of liquid water. Hence an obvious necessity for thoroughly effective condensation when mercury is to be determined in its compounds by ignition with soda-lime.—*Silliman's Journal, July*, 1860.

ON THE DROP AND MINIM MEASURE.

By Mr. Barnard S. Proctor.

What is meant by "gtt."?

This is a question which the dispenser must often ask himself, and find difficulty in deciding upon any fixed answer which will serve all occasions, or in deciding upon any rule which will guide him as to which of two or three meanings he should attach to the term as various occasions arise.

It has been more than once pointed out that a drop varies much in size according to the form and size of the vessel from which it falls—also that it varies according to the density and viscosity of the fluid, and according to some other of its qualities not yet well understood.

There can be no doubt that it would be much better on the part of the prescriber to do away with the term "gtt." altogether; but while it is used, sometimes to express a minim, and sometimes two-thirds of a minim, and sometimes a drop, without any definite idea of its value, it remains with us to decide, as best we can, how much tincture of digitalis or hydrocyanic acid is to be used in obedience to the physician's order of "gtt. xij." If all were agreed, it would probably be best to understand minims when guttæ are prescribed, which uniformity of practice might probably be obtained by adding a note to the table of measures in the Pharmaccpœia, to the effect that minims shall, for the future, take the place of drops; and this would probably also expedite the disuse of the ambiguous term by the profession.

There are, however, certain circumstances under which quantity may be advantageously estimated by drops. If a few minims of a powerful tincture are ordered in a draught, the minim meter is at once convenient and accurate; but if a few minims of oil are to be added to a pill mass, the case is otherwise—the proportion adhering to the measure being large and difficult of removal.

With the view of facilitating accuracy in such-like cases, I have ascertained the number of drops equal to fʒj. of various essential oils, &c., when dropped from the bottles in which they are respectively kept, and have marked these numbers permanently upon the bottles, thus—Ol. Menth. P., 110; Ol. Caryophyl, 90; so that if ♏xij. of either of these are prescribed, twenty-two drops of the former or eighteen of the latter may be used. It is not necessary to trouble about the comparative fluidity of the various liquids, or the thickness of the bottle lip; but it is necessary to see that the dropping is always performed in the same manner: fifty-four drops of hydrocyanic acid equalled fʒj., when each drop fell clearly from the lip of the phial; but if the stopper were not entirely removed, and the drop fell conjointly from the stopper and lip of the phial, thirty-two drops filled the same measure.

I subjoin a few of the numbers thus in use:—

Ol. Tiglii.,	100	drops	= fʒj.	Tr. Digital.,	96	drops	= fʒj.
“ Lavand. Ang.	120	“	“	Tr. Opii,	108	“	“
“ “ Exot.	95	“	“	Creasote,	110	“	“
“ Carui.,	98	“	“	Acid. Hydrochl.,	45	“	“
“ Menth. P.,	110	“	“	“ Nitric.,	72	“	“
“ Caryophyl,	90	“	“	“ Hydrochl. dil.	65	“	“
Otto Rosæ,	150	“	“	“ Hydrocyan.,	54	“	“
Chloroform,	250	“	“				

Dr. Pereira says of chloroform:—“The dose internally may be from five to twenty minims, or more. The physicians of the United States have been in the habit of prescribing it in much larger doses;” and quoted several cases in which from 76 to 100 *drops* were given. Probably these doses were not greater than those of his own prescribing.

A reference to the table will also show the difference between selling otto of roses by the drop and by the drachm in a stronger light than some of your readers may have hitherto seen it.

There might be other points of interest considered in connexion with this table, but I will not add more, save a word of caution against any one adopting the numbers above given without direct experiment in each case.—*Lon. Pharm. Journ. July* 2, 1860.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

Report of the Pharmacopœia Committee.

At a meeting of the Council, held at the Royal College of of Physicians, London, on the 16th June,

Present—Sir Benjamin C. Brodie, President, in the chair; Dr. Burrows, Mr. Green, Mr. Nussey, Dr. Bond, Dr. Embleton, Do. Storrar, Dr. Alexander Wood, Dr. Andrew Wood, Mr. Watt, Mr. Syme, Dr. A. Thomson, Dr. A. Smith, Dr. Williams, Dr. Leet, Dr. Apjohn, Dr. Corrigan, Sir James Clark, Sir Charles Hastings, Mr. Lawrence, Mr. Teale, Dr. Christison, Dr. Stokes, Dr. F. Hawkins, *Registrar*.

Dr. Christison presented the following report of the Pharmacopœia Committee, which was received and ordered to be printed in the minutes:—

"*Report of the Pharmacopœia Committee, June* 16*th*, 1850.

"The Committee appointed by the General Council of Medical Education and Registration beg to submit to the Council the following Report of the progress made towards the completion of the 'British Pharmacopœia.'

"The British Pharmacopœia consists of two parts, and an Appendix. In the first is contained a list of all substances employed in the treatment of disease. It is, in fact, a complete list of the materia medica. Each substance is introduced, with its Latin or scientific name, the English translation of the same, its definition, and its source. These constitute the really officinal portion of the first part. It is, however, proposed to append to each article some of the more important characters by which it may be recognized, and the tests by which its purity may be ascertained; and, lastly, the names of the different officinal preparations, into which it enters as an important ingredient, will be enumerated. This part of the Pharmacopœia has been completed, as far as the number of substances to be introduced is concerned; and has been divided into three portions, which have been allotted to the different Sub-Committees.

"The Dublin Committee have made considerable progress in their third part, and also completed some of the more important processes for the metallic preparations.

"The Edinburgh Committee have devoted considerable attention to their part of the work, and could finish it in a short period of time.

"The London Committee have completed about half their share, and the remainder is in a forward state. Specimen pages, illustrating the mode in which this portion of the work is proposed to be framed, have been prepared for submission to the Committee.

"The list of the materia medica, or first part of the Pharmacopœia, is necessarily, for various reasons, in a less advanced state than the second half; but it is, at the same time the portion which may be speedily finished, when the various groups of officinal preparations are framed. Its completion requires little or no experimental inquiry, but necessarily demands that the Galenical preparations should have been definitely determined upon.

"The second part of the British Pharmacopœia consists of different groups of the preparations of substances contained in the first, together with the processes for preparing the metallic or other chemical drugs. The proposed groups, often named Galenical, are the following;—The acids, confections, cataplasms, decoctions, enemata, extracts, honey, &c., infusions, liniments, lozenges, mixtures and mucilages, ointments, plasters, pills, spirits, syrups, tinctures, vinegars, waters, and wines.

"To the Edinburgh Committee have been allotted the cataplasms. decoctions, honeys, lozenges, plasters, syrups, and waters.

"To the Dublin Committee, enemata, infusions, mixtures and mucilages, pills, tinctures, wines, and ointments.

"To the London Committee, the acids, confections, extracts, liniments, powders, spirits, and vinegars.

"Each group, when completed by any Committee, has been sent to the other Committees, received their comments, and then revised by the Committee who originally framed it.

"The secretary of the Edinburgh Sub-Committee reports that all the groups specially allotted to it have been drawn up and transmitted for revision to one or other of the associate Committees, and that this Committee has likewise commented upon the mixtures and mucilages, infusions, powders, confections, enemata, and ointments; and, lastly, it has re-examined most of its own groups, after receiving the comments of the other Committees.

"The Dublin Committee has constructed all the groups allotted to it; has transmitted them to the other Committees; has received the comments of the associate Committees upon the ointments, enemata, infusions, mixtures and mucilages, and replied to them.

"It has also considered and reported upon the acids, honeys, lozenges, confections, powders, decoctions, waters, and plasters, received either from the London or Edinburgh Committees.

"The London Committee has framed all the groups allotted to it, with the exception of the extracts; this group has been deferred, in order to allow experiments to be made during the present summer season; but it is now in a very forward state, and will soon be ready for transmission to Dublin and Edinburgh.

"The London Committee has also carefully revised and commented upon all the groups received from Edinburgh and Dublin; in fact, upon all the Galenical groups, with the exception of the tinctures and wines; and, lastly, it has revised some of its own preparations, after having taken into consideration the criticisms of the associate Committees.

"A portion of the second part of the Pharmacopœia has been set up in type, for the purpose of being submitted to the Committee.

"Having passed over in review the work which has already been accomplished by the Pharmacopœia Committee, it remains to be shown what is still incomplete, and the probable time required for its completion.

"To complete the second part of the Pharmacopœia, a few weeks only would be required, as far as the Sub-Committees are concerned.

"The first portion of the work might probably occupy a month or two longer, requiring some points to be arranged by conference; and lastly the Appendix—which will contain the substances employed in the preparation of chemicals, but not themselves used as medicines, together with the tests for the detection of the qualities of drugs—might be estimated to occupy about a month.

"Should the Sub-Committees continue to work diligently, it is probable that the work might be prepared for press by the middle or latter end of November; but to ensure this, it may be necessary that at least one meeting of the General Committee, formed by deputies from the different Sub-Committees, should be held previous to that time."

Dr. Christison further reported from the Pharmacopœia Committee, that the Committee had felt it advisable to refer to the General Medical Council for instructions as to the powers of the Committee in certain parts of the business entrusted to them by the Council. The Council were of opinion that the Committee had rightly interpreted their powers. In connexion with this opinion, Dr. Christison, as requested by the Pharmacopœia Committee, moved the following resolutions, which were seconded by Dr. Storrar, and agreed to by the Council:—

"1. That it be remitted to the Pharmacopœia Committee, either to dispose of the forthcoming edition of the British Pharmacopœia to a publisher or publishers, or to publish the edition as the property of the General Medical Council, according as the Committee shall judge to be expedient."

"2. That, in the event of the Committee resolving to sell the edition, the Executive Committee of the General Medical Council shall have the power to grant, in favor of the publisher of the work, such title in the property of it as the General Council can grant."

"3. That the sum of 500*l.* be voted by the General Medical Council, in addition to the vote of November 24th, 1858, towards defraying the current expenses of the Pharmacopœia Committee."—*Lon. Pharm. Journ. July*, 1860.

MEANS OF DETECTING THE ADULTERATION OF CHINESE RHUBARB WITH THE AID OF ESSENTIAL OILS.

By Emile Rillot, Pharmacien à Mutzig (Bas-Rhin).

Chinese Rhubarb has at all times been sufficiently high in price to form a temptation to the cupidity of adulterators. M. Chevallier, in his *Treatise on Adulterations*, says that, in 1846, there was cultivated in the suburbs of Paris a species of rhubarb, which was sold as foreign to the pharmaciens in the country. This rhubarb could not well be sold to the public whole, for the fraud was too evident; but it is probable that it was powdered and then mixed in varying proportions with Chinese rhubarb. The mixture of powdered Rhapontic with Chinese rhubarb is difficult to discover, for the color, odor, and taste of Rhapontic, although more feeble, are nevertheless very analogous to Chinese. The trials which I have made to detect this adulteration have produced some results, which will, I believe, be useful to my brethren, and enable them to discover even the smallest quantities of Rhapontic rhubarb mixed with Chinese rhubarb.

When the different varieties of rhubarb are treated with nitric acid, a peculiar coloration is produced, which M. Garot has designated by the name of *érythrose.* This coloration is yellow with the indigenous rhubarbs, and orange with the exotic kinds. The essential oils produce an inverse effect, that is to say, Rhapontic rhubarb produces a coloration which varies from orange to flesh color, whilst Chinese rhubarb experiences no change of color.

The following tables show the reactions obtained by means of different portions of Rhapontic rhubarb mixed with Chinese rhubarb.

When equal parts of Chinese rhubarb and magnesia are mixed together, a yellowish color is produced; when this is diluted with a further quantity of magnesia, and some essence of aniseed added, this coloration remains the same; but when we take equal parts of Rhapontic rhubarb and carbonate of magnesia and add essence of aniseed, there is produced after a strong trituration for five minutes a reddish-orange salmon color. By this means alone we can distinguish powdered Chinese rhubarb from that of Rhapontic; but my trials have been principally carried on upon the coloring action of mixtures of Rhapontic and Chinese rhubarb. The following is the order in which I have made these trials:—

No. 1.

Chinese Rhubarb	2 grammes.
Calcined or Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After trituration for five minutes, we obtain but little difference of coloration.

No. 2,

Rhapontic Rhubarb	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain an organic-salmon coloration; the powder attached to the pestle has the appearance of red lead (*minium*).

No. 3.

Rhapontic Rhubarb	2 grammes.
Calcined Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain a very intense rose-salmon coloration.

No. 4.

Rhapontic Rhubarb	2 grammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain a lively rose-salmon color, but the rose is more evident than that in No. 3.

No. 4 *bis.*

Rhapontic Rhubarb	50 centigrammes.
Chinese Rhubarb	50 centigrammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain a rose-flesh-salmon color.

No. 5.

Rhapontic Rhubarb	30 centigrammes.
Chinese Rhubarb	70 centigrammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	28 drops.

After a trituration for five minutes, we obtain again the same coloration as in No. 4 *bis.*

And whenever the quantity of powdered Rhapontic rhubarb is diminished, we constantly obtain a more or less deep rosy coloration. We can, by this means, discover the slightest trace of Rhapontic rhubarb; but it is necessary to observe, that it is much better to employ simultaneously the two kinds of magnesia, for the carbonate gives a coloration more yellowish-red, leaning to rose, whilst calcined magnesia produces a coloration more decidedly rose. The essential oils of bergamot, citron, &c., produce similar reactions. The essence of mint decolorizes, so to speak, at first (and only after a long trituration), the mixture of Chinese and Rhapontic rhubarbs; but the rose color is soon restored; whilst with the Chinese rhubarb it produces only a dull grey color.—*London Pharm. Journ.*, *July* 2, 1860, *from Journal de Chimie Médicale*, June, 1860.

ON THE ARSENIC EATERS OF STYRIA.

By Charles Heisch, Esq., F.C.S.

Lecturer on Chemistry at the Middlesex Hospital Medical College.

At the last meeting of the Manchester Philosophical Society I observe that Dr. Roscoe called attention to the arsenic eaters of Styria. Having for the last two years been in communication with the medical men and other residents in the districts where this practice prevails, I shall feel obliged if you will allow me through your journal to make known the facts I have at present collected. The information is derived mainly from Dr. Lorenz, Imperial Professor of Natural History, formerly of Salzburg, from Dr. Carl Arbele, Professor of Anatomy in Salzburg, and Dr. Kottowitz, of Neuhaus, besides several non-medical friends. If human testimony be worth anything, the fact of the existence of arsenic eaters is placed beyond a doubt. Dr. Lorenz, to whom questions were first addressed, at once stated that he was aware of the practice, but added, that it is generally difficult to get hold of individual cases, as the obtaining of arsenic without a doctor's certificate is contrary to law, and those who do so are very anxious to conceal the fact, particularly from medical men and priests. Dr. Lorenz was, however, well acquainted with one gentleman, an arsenic eater, with whom he kindly put me in communication, and to whom I shall refer again more particularly. He also says that he knows arsenic is commonly taken by the peasants in Styria, the Tyrol, and the Salzkammergut, principally by huntsmen and woodcutters, to improve their wind and prevent fatigue. He gives the following particulars:—

The arsenic is taken pure in some warm liquid, as coffee, fasting, beginning with a bit the size of of a pin's head, and increasing to that of a pea. The complexion and general appearance are much improved, and the parties using it seldom look so old as they really are, but he has never heard of any case in which it was used to improve personal beauty, though he cannot say that it never is so used. The first dose is always followed by slight symptoms of poisoning, such as burning pain in the stomach and sickness, but not very severe.

Once begun it can only be left off by very gradually diminishing the daily dose, as a sudden cessation causes sickness, burning pains in the stomach, and other symptoms of poisoning, very speedily followed by death.

As a rule, arsenic eaters are very long lived, and are peculiarly exempt from infectious diseases, fevers, &c.; but unless they gradually give up the practice invariably die suddenly at last.

In some arsenic works near Salzburg with which he is acquainted, he says the only men who can stand the work for any time are those who swallow daily doses of arsenic, the fumes, &c., soon killing the others. The director of these works, the gentleman before alluded to, sent me the following particulars of his own case. (This gentleman's name I suppress, as he writes that he does not wish the only thing known about him in England to be the fact that he is an arsenic eater; but if any judicial inquiry should arise which might render positive evidence of arsenic eating necessary, his name and testimony will be forthcoming.)

"At seventeen years of age, while studying assaying, I had much to do with arsenic, and was advised by my teacher, M. Bönsch, Professor of Chemistry and Mineralogy at Eisleben, to begin the habit of arsenic eating. I quote the precise words he addressed to me. 'If you wish to continue the study of assaying, and become hereafter superintendent of a factory, more especially of an arsenic factory, in which position there are so few, and which is abandoned by so many, and to preserve yourself from the fumes which injure the lungs of most, if not of all, and to continue to enjoy your customary health and spirits, and to attain a tolerably advanced age, I advise you, nay, it is absolutely necessary, that besides strictly abstaining from spirituous liquors, you should learn to take arsenic; but do not forget when you have attained the age of fifty years gradually to decrease your dose, till from the dose to which you have become accustomed, you return to that with which you began, or even less.' I have made trial of my preceptor's prescriptions till now, the forty-fifth year of my age. The dose with which I began, and that which I take at present, I enclose; they are taken once a day, early, in any warm liquid, such as coffee, but not in any spirituous liquors." The doses sent were No. 1, original dose, three grains; No. 2, present dose, twenty-three grains of pure white arsenic in coarse powder. Dr. Arbele says this gentleman's daily dose has been weighed there also, and found as above. Mr. —— continues:—"About an hour after taking my first dose (I took the same quantity daily for three months), there followed slight perspiration with griping pains in the bowels, and after three or four hours a loose evacuation; this was followed by a keen appetite, and a feeling of excitement. With the exception of the pain, the same symptoms follow every increase of the dose. I subjoin as a caution that it is not advisable to begin arsenic eating before the age of twelve or after thirty years." In reply to my question, if any harm results from either interrupting, or altogether discontinuing the practice, he replies, "Evil consequences only ensue from a long continued interruption. From circumstances I am often obliged to leave it off for two or three days, and I feel only slight languor and loss of appetite, and I resume taking the arsenic in somewhat smaller doses. On two occasions, at the earnest solicitations of my friends, I attempted entirely to leave off the arsenic. The second time was in January, 1855. I was induced to try it a second time from a belief that my first illness might have arisen from some other cause. On the third day of the second week after leaving off the dose I was attacked with faintness, depression of spirits, mental weakness, and a total loss of the little appetite I still had; sleep also entirely deserted me. On the fourth day I had violent palpitation of the heart, accompanied by profuse perspiration. Inflammation of the lungs followed, and I was laid up for nine weeks, the same as on the first occasion of leaving off the arsenic. Had I not been bled, I should most likely have died of apoplexy. As a restorative, I resumed the arsenic eating in smaller doses, and with a firm determination never again to be seduced into leaving it off, except as originally directed by my preceptor. The results on both occasions were precisely the same, and death would certainly have ensued had I not resumed arsenic eating." One of the most remarkable points in this narrative is that this gentleman *began* with a dose which we should consider poisonous. This is the only case of which I have been able to obtain such full particulars, but several others have been mentioned to me by those who knew the parties and can vouch for their truth, which I will briefly relate.

One gentleman, besides stating that he is well aware of the existence of the practice, says he is well acquainted with a brewer in Klagenfürth, who has taken daily doses of arsenic for many years. He is now past middle life, but astonishes every one by his fresh juvenile appearance; he is always exhorting other people to follow his example, and says, "See how strong and fresh I am, and what an advantage I have over you all! In times of epidemic fever or cholera, what a fright you are in, while I feel sure of never taking infection."

Dr. Arbele writes, "Mr. Curator Kürsinger (I presume curator of some museum at Salzburg), notwithstanding his long professional work in Lungau and Binzgau, knew only two arsenic eaters—one the gentlemen whose case has just been related, the other the ranger of the hunting district in Grossarl, named Trauner. This man was at the advanced age of 81, still a keen chamois hunter, and an active climber of mountains; he met his death by a fall from a mountain height, while engaged in his occupation. Mr. Kürsinger says he always seemed very healthy, and every evening regularly, after remaining a little too long over his glass, he took a dose of arsenic, which enabled him to get up the next morning perfectly sober and quite bright. Professor Fenzl, of Vienna, was acquainted with this man, and made a statement before some learned society concerning him, a notice of which Mr. Kürsinger saw in the *Wiener Zeitung;* but I have not been able to find the statement itself. Mr. Krum, the pharmaceutist here, tells me that there is in Salzburg a well-known arsenic eater, Mr. Schmid, who now takes daily twelve and sometimes fifteen grains of arsenic. He began taking arsenic from curiosity, and appears very healthy, but always becomes sickly and falls away if he attempts to leave it off. The director of the arsenic factory before alluded to is also said to be very healthy, and not to look so old as 45, which he really is.*

As a proof how much secrecy is observed by those who practice arsenic eating, I may mention that Dr. Arbele says he inquired of four medical men, well acquainted with the people of the districts in question, both in the towns and country, and they could not tell him of any individual case, but knew of the custom only by report.

Two criminal cases have been mentioned to me, in which the known habit of arsenic eating was successfully pleaded in favor of the accused. The first by Dr. Kottowitz, of Neuhaus, was that of a girl taken up in that neighborhood on strong suspicion of having poisoned one or more people with arsenic, and though circumstances were strongly against her, yet the systematic arsenic eating in the district was pleaded so successfully in her favor, that she was acquitted, and still lives near Neuhaus, but is believed by every one to be guilty. The other case was mentioned by Dr. Lorenz. A woman was accused of poisoning her husband, but brought such clear proof that he was an arsenic eater, as fully to account for arsenic being found in the body. She was, of course, acquitted.

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*The man above mentioned seems quite to differ with Mr. ——— on the impropriety of taking arsenic with spirituous liquors, and actually employs it as a means of correcting their effects. All others that I have heard of, concur in saying that it should be taken fasting.

One fact mentioned to me by some friends is well worthy of note. They say: "In this part of the world, when a graveyard is full, it is shut up for about twelve years, when all the graves which are not private property by purchase are dug up, the bones collected in the charnel-house, the ground ploughed over, and burying begins again. On these occasions, the bodies of arsenic eaters are found almost unchanged, and recognizable by their friends. Many people suppose that the finding of their bodies is the origin of the story of the vampire." In the *Medicinischer Jahrbuch des Oster: Kaiserstaates*, 1822, *neuest Folge*, there is a report by Professor Schallgruber, of the Imperial Lyceum at Grätz, of an investigation undertaken by order of government into various cases of poisoning by arsenic. After giving details of six *post-mortem* examinations, he says: "The reason of the frequency of these sad cases appears to me to be the familiarity with arsenic which exists in our country, particularly the higher parts. There is hardly a district in Upper Styria where you will not find arsenic in at least one house, under the name of hydrach. They use it for the complaints of domestic animals, to kill vermin, and as a stomachic to excite an appetite. I saw one peasant show another on the point of a knife how much arsenic he took daily, without which, he said, he could not live; the quantity I should estimate at two grains. It is said, but this I will not answer for, that in that part of the country this poison is used in making cheese; and, in fact, several cases of poisoning by cheese have occurred in Upper Styria, one not long since. The above-mentioned peasant states, I believe truly, that they buy the arsenic from the Tyrolese, who bring into the country spirits and other medicines, and so are the cause of much mischief." This report is, I believe, mentioned in Orfila's *Toxicology,* and one or two other works, but I have not seen it quoted myself; it is interesting, as being early and official evidence of arsenic eating. Since I received the above information, a gentlemen who was studying at this hospital, told me that, when an assistant in Lincolnshire, he knew a man who began taking arsenic for some skin disease, and gradually increased the dose to five grains daily. He said he himself supplied him with this dose daily for a long time. He wrote to the medical man with whom he was assistant, and I have been for a long time promised full particulars of the case, but beyond the fact that he took five grains of arsenic, in the form of Fowler's solution, daily, for about six years, and could never leave it off without inconvenience, and a return of his old complaint, I have as yet not received them. I have delayed publishing these facts for some time, hoping to get information on some other points, for which I have written to my friends abroad; but as considerably delay takes place in all communications with them, I have thought it better to publish at once the information I have already received. All the parties spoken of are people on whom the fullest reliance can be placed, and who have taken much pains to ascertain the foregoing particulars. The questions which still remain unanswered are these :—

1st. Can any official report be obtained of the trials of the two people mentioned by Drs. Kottowitz and Lorenz ?

2nd. Do medical men in these districts, when using arsenic medicinally, find the same cumulative effects as we experience here ? Or is there anything in the air or mode of living which prevents it ?

3rd. Can any evidence be obtained as to how much of the arsenic taken is excreted ? To show whether the body gradually becomes capable of enduring its presence, or whether it acquires the power of throwing it off.*

I have proposed to the gentleman who furnished me with the particulars of his own case, either to make an estimate of the arsenic contained in his own urine and fæces during twenty-four hours, or to collect the same and forward them to me that I may do so, but as yet have received no answer.—*London Pharm. Jour., May* 1, 1860.

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*The fact of the preservation of the bodies shows that some considerable quantity must be retained.

GLEANINGS FROM ANNALEN DER CHEMIE UND PHARMACIE.

By John M. Maisch.

Behaviour of Sesquisalts of Iron to Sulphurous and Hyposulphurous Acid.—Hugo Schiff confirms the observations of Phillips and Schönbein, that sesquisalts of iron are rendered darker or red by SO_2. Sulphocyanide of iron—less readily a mixture of sesquichloride of iron and sulphocyanide of sodium—is decolorized, without being previously darkened; previous digestion of SO_2 with zinc, causes an instantaneous decolorization, likewise a solution of hyposulphite of soda. Lenz's observation, that other salts of $Fe_2\,O_3$ are for a short time colored violet by NaO,S_2O_2, is correct; it is only after several hours, that sulphur is separated, probably the result of a secondary reaction. (Vol. cxi. 366, 367.)

An alcoholic solution of Biniodide of Mercury continues, even after 15 months, to be precipitated by water in the yellow modification of the iodide. H. Schiff remarks that on the addition of water, the solution turns milky and separates, after several hours, tabular rhombic crystals, showing by polarization under the microscope beautiful spectra, which are not observed with the red crystals—(Vol. cxi. 371, 372.)

Reactions of Tincture of Guaiacum.—A trace of chlorine imparts to tincture of guaiacum an intensely blue color. H. Schiff has observed the following reactions: with iodine a dirty green, or no coloration, on the addition of water blue; acids prevent this reaction, not the neutral salts. The tincture when colored blue by Fe_2Cl_3, is rendered bright violet by NaO,S_2O_2; the liquid is rapidly decolorized; the same blue tincture is slowly decolorized by SO_2, but immediately, without imparting any purplish color, if the SO_2 has been previously digested with zinc. Resin of guaiacum dissolves in concentrated

SO_3 with a beautiful red color, which is altered by alcohol to violet blue, afterwards bluish green; water precipitates the solution purplish. If concentrated SO_3 is added to some iron filings, and the resulting gas conducted into tincture of guaiacum, this will assume a blue color, if nitric acid was present.—(Vol. cxi. 373.)

On the influence of Chlorous Acid upon Organic Substances.—J. Schiel, Ann. cxii. 73—80, has made some experiments, and obtained the following results: anhydrous glycerin absorbs a portion of gaseous ClO_3, when an explosion takes place; after that the reaction between the two bodies is progressing slowly, even in direct sunlight. By PbO ClO_3 and SO_3 alcohol is converted into acetic ether; amylic alcohol into valerianate of oxide of amyle. Urea dissolves in aqueous ClO_3 with evolution of CO_2 and probably NO, and is converted into a crystalline compound, having a slight acid reaction, soluble in alcohol and water, and of the composition $C_2N_2H_4O_2+NH_4Cl$; its chemical behaviour, however, does not coincide with this formula. Uric acid under the same circumstances yields pearly scales, soluble in water and boiling alcohol, and producing, after neutralization with soda, a crystalline precipitate with baryta and lead salts, and a curdy precipitate with nitrate of silver: the author calls it *chloraluric acid*, and has found its formula, $C_{14}H_{11}N_6ClO_{11}$. Besides this, another substance is formed which, on the application of heat, readily yields murexide.

On Quercitrin.—H. Hlasiwetz has studied the decomposition of quercitrin, (Annal. cxii. 96—118.) By hot potassa, quercetin yields sugar, (phloroglucin $C_{12}H_6O_6+4HO$,) quercetic acid, $2HO$, $C_{34}H_{10}O_{14}+7HO$, and a body which appears to be a compound of two equivalents of the former, with one of the latter. Quercetic acid crystallizes, is soluble in alcohol, ether and hot water, is partly sublimable, colors Fe_2Cl_3 deep bluish black; its solution is colored yellow by alkalies, turning carmine red in contact with air. The formula for quercetin was found to be $C_{46}H_{16}O_{20}$, but it retains at 200°C. (392° F.) 1HO. The composition of quercitrin, as analysed by Bolley, must be $C_{70}H_{36}O_{40}$, of the author's and many other chemists' $C_{58}H_{30}O_{34}$, of Rochleder's, obtained from the leaves of the horse chestnut, $C_{82}H_{46}O_{50}$, that is quercetin + 1, 2 and 3 equivalents of sugar.

Quercitrin has been discovered in Quercus tinctoria (Chevreul,) Ruta graveolens (Weiss & Kümmel,) Saphora japonica, (Stein,) Capparis spinosa, (Rochleder & Hlasiwetz,) Aesculus hippoc. (Rochleder,) and the author thinks it likely to exist in Rhamnus tinct. Reseda luteola and Thuja occid. Phloroglucin is interesting from being a constituent also of phloricin. The author mentions the following colors as capable of being produced from quercitrin and its compounds: yellow, by quercitrin and quercetin; brown, by quercitrin, alkalies and oxygen; green, by quercitrin and Fe_2O_3; blue by quercetic acid and Fe_2O_3; red, by quercetic acid, alkalies and oxygen; violet, by a combination of the last two, and by phloroglucin and Fe_2O_3.

On Kinovin.—Prof. H. Hlasiwetz found that kinovin yields sugar, when treated in alcoholic solution with muriatic acid gas. Dr. Gilm has farther investigated the subject, (Annal. cxi. 182—191.) The sugar is $C_{12}H_{12}O_{10}$ and resembles Berthelot's mannitan; the other product is of an acid nature, and to it properly belongs the name of kinovic acid, hitherto usually applied to kinovin. It consists of $2HO,C_{48}H_{36}O_6$, is tasteless, insoluble in water, soluble in much boiling alcohol, readily soluble in alkalies and their carbonates, yielding intensely bitter solutions, which are precipitated by the salts of the heavy metals. The composition of kinovin is $C_{60}H_{48}O_{16}$.

Determination of Albumen and Syntonin.—C. Boedeker attempted to estimate these two bodies by precipitating their solution in acetic acid, by ferrocyanide of potassium. If Lieberkühn's formula for albumen is doubled, viz. $C_{144}H_{112}N_{18}O_{44}S_2$, it requires one equivalent KCfo for complete precipitation; 1612 albumen yield with 211 KCfo+3HO, 1720 hydro-ferrocyanate of albumen. The formula for syntonin cannot vary much from $C_{144}H_{112}N_{18}O_{42}S$; these 1580 parts likewise require 211 KCfo+3HO and form 1688 hydro-ferrocyanate of syntonin. If 1.309 grm. crystallized KCfo+3HO is dissolved in 1000 cub. centimetres water, each c.cm. is completely precipitated by .01 grm. albumen. The solution of albumen is diluted with its own bulk of acetic acid and filtered ; 5 c.cm. of it are agitated with the same volume of the test liquid and filtered; the filtrate is usually turbid, if albumen is in excess, and is precipitated by KCfo and albumen; if the ferrocyanide is in excess, it is clear and precipitated only by albumen. In a second experiment, either the KCfo or the albumen is doubled, and the filtrate again tested; if necessary, a third and a fourth experiment is then made, in which the test liquid is adjusted in accordance with the previous result, until the point is ascertained, when the filtrate is not precipitated by either of the liquids.—(Vol.. cxi. 195—205.)

Synthesis of Acetic Acid.—J. A. Wanklyn passed carbonic acid into a mixture of sodium, zinc, and their compounds, with methyle; after amalgamating the free metals with mercury, the product was distilled with diluted sulphuric acid. The distillate contains acetic acid, the presence of ether has no influence on the result.—$2CO_2+Na, C_2H_3=C_4H_3NaO_4$. (Vol. cxi. 234—236.)

Estimation of Magnesia and the fixed Alkalies.—The presence of magnesia does not interfere with the estimation of potassa by bichloride of platinum. Prof. Th. Scheerer, therefore, proposes the following way : the whole amount of the above bases is estimated as their sulphates; from a weighed portion the magnesia is determined as pyrophosphate, the potassa from another portion as platina chloride; the remainder is soda.—(Ann. d. Ch. and Ph. cxii. 177, 178, from Nachr. d. K. Ges. d. Wiss. zu Goettingen.)

On Guaiac Resin.—Prof. Hlasiwetz prepares a concentrated solution, of one part of the resin in alcohol, precipitates with ½ part caustic potassa in alcohol, expresses the mother liquor, and washes the residue with alcohol, afterwards with water. This potassa salt crystallizes from a solution in much boiling diluted alcohol; dissolved in very diluted boiling potassa, muriatic acid precipitates the resinous acid, which crystallizes from its alcoholic solution on spontaneous evaporation, and possesses a faint but agreeable odor of vanilla; it is not rendered blue by oxidizing agents.—(Vol. cxii. 182—184.)

On Vegetable Parchment.—Prof. A. W. Hofmann, publishes in Ann. d. Ch. and Ph. vol. cxii. 243—256, a report made to Messrs. De la Rue & Co., of London about a year ago. The parchment is prepared by immersing for a few seconds, at 60° F., unsized paper in diluted sulphuric acid, the limits of dilution for four volumes of HO, SO_3 are between one and two vols. water. It is afterwards washed in water, then in diluted ammonia, and lastly again in water. Its composition is that of cellulose, its strength is five times greater than the unsized paper, and $\frac{3}{4}$ the strength of animal parchment, which otherwise it closely resembles. The honor of the scientific discovery in 1847, of this transformation of paper, belongs to Messrs. J. A. Poumarède and L. Figuier, of Paris; but the perfection of the process is W. E. Gaine's work; the demand for this article already exceeds the supply.

On the equivalent weight of Manganium and Nickel.—Rawack determined the amount of water obtained from Mn_3O_4, when reduced in a current of pure hydrogen to MnO; R. Schneider ascertained the water and carbonic acid, yielded by the protoxalate $C_4Mn_2O_8+4HO$. The medium of 10 experiments was 27·019; Schneider puts the equivalent weight of manganium at 27. Agreeing with his formor experiments, Schneider again found the weight of equivalent of Ni=29·029.—(Pogg. Ann. cvii. Ann. d. Ch. and Ph. cxiii.)

Synthesis of Salicylic Acid.—Prof. Kolbe considers salicylic acid to be composed of carbonic acid and oxide of phenyle=$(HO, C_{12}H_5O)C_2O_4$. He and Lautemann have now discovered that salicylate of soda is formed, on passing carbonic acid into hydrated oxide of phenyle, while sodium is being dissolved therein; hydrogen is evolved.—(Ann. d. Ch. and Ph. cxiii. 125—127.)

On the composition of Petroleum.—A considerable quantity of petroleum is obtained near Sehnde, a village in the neighborhood of Hanover, Germany. In its crude state, it is greenish brown, rather thin, of a disagreeable odor, and contains a rather large proportion of paraffin. The rectified oil was the subject of investigations, by Drs. Bussenius and Eisenstuck, who found it to consist of different carbohydrogens, some of which distil below 180° C., and partly form a crystallizing, nitro-compound under the influence of sulphuric and nitric acids. These carbohydrogens they call *petrole;* they appear to be composed of $C_{16}H_{10}$ and $C_{18}H_{12}$. Dr. Eisenstuck attempted to separate the various constituents, by repeated fractional distillations, from 5 to 5°C.; but after continuing it for seven weeks, he had not been able to obtain a product of a constant boiling point. The specific gravity at 0° C., of the different portions ranged between ·7136 and .7444 ; he also ascertained the specific gravity of their vapor and their expansion, and comes to the conclusion that they are composed in accordance with the formula C_nH_n. Sulphuric, nitric and muriatic acids do not react with them; picric acid yields unstable compounds ; chlorinated compounds, which however, could not be obtained pure, were obtained with chlorine and with perchloride of phosphorous. Dr. E. has operated with the distillate obtained below 130° C.—(Vol. cxiii. 161—183.)

To transform Lactic into Propionic Acid.—E. Lautemann, (Ann. d. Ch. and Ph. cxiii. 217–220,) saturated diluted lactic acid (with 1 volume of water,) with hydriodic acid, and heated the liquid in a closed tube to 140° C. Neutralized with KO, distilled with SO_3, and treated with AgO, CO_2, propionate of silver was obtained on evaporation. If 3·5 parts of lactic acid are diluted with little water, and four parts of biniodide of phosphorus added, propionic acid with some iodine distils over.

The conversion of Lactic Acid into Alanin has been effected by Prof. H. Kolbe, (Ann. d. Ch. and Ph. cxiii. 220—222,) by distilling the limesalt first, with pentachloride of phosphorus, and treating the product with absolute alcohol. This chloropropionic ether is heated with concentrated ammonia for several hours in a closed tube to 100° C., evaporated, acidulated with muriatic acid, exsiccated, exhausted with hot alcoholic ether, the tincture boiled with water, treated with freshly precipitated oxide of lead, then with sulphuretted hydrogen, it is now evaporated and recrystallized. If basic nitrate of lead is employed, the result is large crystals of nitrate of alanin.

Preparation of LacticAcid.—Lautemann alters Bensch's process (see Gmelin's Handbook, Cavendish edition, xi. 475,) by using sugar, tartaric acid, milk and cheese, as directed by B., ⅓ more of water, and instead of chalk, ordinary white zinc; the temperature ought to be kept at from 40 to 45° C. (104 to 113°F.) and the mixture frequently agitated; lactate of zinc crystallizes in from 8 to 10 days. The whole is heated to boiling, filtered, evaporated, again filtered and after crystallization, recrystallized; the lactate is then dissolved in boiling water and decomposed by sulphuretted hydrogen; the acid liquor is evaporated, and freed from mannite by dissolving in ether and distilling it off.—(Vol. cxiii. 242, 243.)

Decomposition of Carbonic Acid by red hot Copper.—Lautemann confirms Perrot's observation that pure metallic copper does not decompose carbonic acid, which is reduced to carbonic oxide by the presence of some iron or zinc.—(Vol. cxiii. 238, 239.)

Volatility of Phosphoric Acid.—Anhydrous phosphoric acid volatilizes, according to Lautemann, when heated in a test tube over an ordinary spirit lamp, with the exception of a small portion which combined with the constituents of the glass.—(Vol. cxiii. 240.)

Electrolytic Observations.—Prof. H. Kolbe found that succinnate of soda yields, on the positive pole, carbonic acid and oxide of methyle; lactate of potassa, however, carbonic acid and aldehyde.—(Vol. cxiii. 244.)

On Copal Resin.—Before copal is used for the preparation of varnishes, it is subjected to a partial dry distillation; Manilla copal yields a dark brown; African copal a greenish distillate, containing copper from the retort. This distillate contains an acid, copalic acid, which has not been obtained in a pure state, several oils and a tarlike body. Prof. J. J. Schivler, found the oil rectified between 160 and 165° C, to be of a pleasant odor, very disagreeable taste, and the composition $C_{20}H_{16}$; the oil boiling above 215° contained 15·6 per cent. oxygen and probably consists of a mixture of various compounds.—(Vol. cxiii. 338—349.)

On Acrolein.—H. Hübner and A. Geuther prepare it from 1 part glycerin, with 2 parts bisulphate of potassa, by distilling to dryness; the yield is 25 to 28 per cent. anhydrous acrolein, boiling at 52.°4 C. (126.3 F.) By treating with pentachloride of phosphorus, the bichloride of acrolein $=C_6H_4Cl_2$ is obtained, being a colorless oily liquid, boiling at 84·°4 C., (184° F.,) of 1·170 specific gravity, at 24·°5 C, and of the odor and taste of chloroform. Acrolein yields with ammonia a solid compound $C_{12}H_{10}NO_3$, in appearance like coagulated albumen, which most likely is an ammonium base. Anhydrous acetic acid combines with acrolein to an oily liquid of 1·076 specific gravity at 22° C., possessing a strong fishy odor and a very sharp taste.—(Vol. cxiv. 35—51.)

On the conversion of Malic and Tartaric Acids into Succinic Acid.—Succinic acid $2HO, C_8H_4O_6$ differs from malic acid $= 2HO, C_8H_4O_8$ and tartaric acid $=2HO, C_8H_4O_{10}$ by containing 2O and 4O less. R. Schmitt (Ann. d. Ch. and Ph. cxiv. 106—111,) converts both these latter acids into the former by saturating concentrated hydriodic acid with pure malic or tartaric acid, and heating the solution in a sealed glass tube, the former to 130° C., the latter not over 120° C. In about eight hours the reaction is completed. The liquid or the crystals are now boiled in a retort with water until iodine ceases to pass over; the residue from evaporation is treated with a little ether, to remove the last traces of iodine, and then recrystallized from water, or, in order to remove some tartaric acid, from boiling ether. The crystals consist of pure succinic acid.

On the use of Gun-cotton.—At ordinary temperature, gun-cotton is not affected by nearly all the strong chemical agents. Prof. Boettger recommends it on this account, for the filtration of strong acids, of liquids readily decomposed by organic substances, &c., for which purposes it is superior to asbestos, granites, glass, &c. He has employed it for the filtration of nitric, fuming sulphuric, nitro-muriatic and chromic acids, permanganate of potassa, concentrated leys, &c.—(Vol. cxiv. 111, 112.)

Nitrobenzole from oil of Turpentine.—The residue from the influence of concentrated nitric acid upon oil of turpentine, when mixed with sand and subjected to dry distillation, yields a brown oil, from which between 200 and 220° C., much nitrobenzole is obtained. Schiff converted it by zinc and muriatic acid into anilin, which was recognized by chromic acid and chloride of lime.—(Vol. cxiv. 201.)

A NEW ALKALOID IN COCA.

Coca is the name under which the leaves of several species of Erythroxylon are and have been known in Peru from time immemorial, and which, especially among the Indians, are used for chewing, mixed with a little unslacked lime or wood ashes. Numerous and somewhat fabulous accounts are given of their physiological action, as for instance in "Tschudi's Travels in Peru." A moderate use is said to produce excitement of the functions, to enable the chewer to remain some time without food, and to bear the greatest bodily exertions; while an immoderate chewing of coca, like that of opium, frequently becomes an habitual vice, producing all the deleterious symptons and consequences of narcotics, such as a state of half intoxication, half of drowsiness, with visionary dreams, premature decay, complete apathy, and idiocy. These peculiar symptoms rendered the presence of a narcotic principle very probable, and have induced Prof. Wœhler and Dr. Niemann, of Goettingen, to undertake the investigation of the substance. The material was furnished by Dr. Scherzer, the naturalist of the exploring expedition in the Austrian frigate Novara. The examination has so far succeeded, by the usual method for the separation of alkaloids, in eliminating a crystallizable base, *cocaïne*, crystallizing in small prisms, devoid of color or odor, slightly soluble in water, more readily in alcohol, and very easily in ether. It possesses a strongly marked alkaline reaction, and a bitter taste, and acts in so far peculiarly, as it transiently benumbs, or almost paralyzes the part of the tongue which it touches. It bears some resemblance to atropine in its chemical relations, and forms perfect salts with the acids. It is, however, without action on the eye, and its compound with the chloride of gold is remarkable for forming benzoic acid in large proportion upon being heated. Further experiments will throw light on its physiological properties.—*Druggists' Circular, August*, 1860.

RESULTS OF AN ANALYSIS OF PENNSYLVANIA PETROLEUM,

Especially respecting its value as a source of hydrocarbon oils, adapted to the purposes of illumination.

By E. S. Wayne.

The recent discovery in Western Pennsylvania and Eastern Ohio of numerous and apparently inexhaustible sources of petroleum, and the bearing it was anticipated to have upon what is as yet a new branch of manufacture (that of coal oil), has made it a subject of much interest and no little anxiety to those engaged in that business.

Through Mr. J. W. Donahue, of this city, I obtained a quantity of Pennsylvania petroleum, sufficient for a practical test of its value, which was sent to him from Holland, Venango county, Pennsylvania. This specimen, which I presume is a fair representation of the quality of it, as obtained from the numerous wells in that locality, was of a peculiar opake, olive green hue; and in odor similar to that petroleum commonly known as Seneka oil, which it very much resembles, with the exception only of its being much thinner in body. Upon testing the specific gravity of it, I found it to be only 815°; much lower than that of Seneka oil and other specimens I had of petroleum, exuding naturally upon Paint Creek, a tributary of the Big Sandy river, Kentucky. Upon exposing a portion of this petroleum to the air, for twenty-four hours, I found that it lost considerable bulk by evaporation, and that it had gained a corresponding increase in gravity, as the remainder upon testing gave 825° specific gravity, ten degrees heavier than the original substance, which was 815°. Ten gallons of this petroleum was submitted to distillation, and the following are the fractional results and specific gravities of the same. The fractions taken of the run of the still were a pint in volume, and the specific gravity given is the average of that quantity, which was a mixture, more or less, of different gravities, ranging between that next above and below it in the column of gravities.

Per cent. 60° Fah.	Spec. grav. 60° Fah.
2·50	·668
1·25	·679
1·25	·695
1·25	·705
1·25	·709
1·25	·719
1·25	·724
1·25	·729
1·25	·735
1·25	·741
1·25	·744
1·25	·747
1·25	·749
1·25	·754
2·50	·761
1·25	·763
1·25	·765
1·25	·769
1·25	·773
1·25	·775
1·25	·778
1·25	·782
1·25	·785
2·50	·787
2·50	·791
1·25	·799
1·25	·801
1·25	·803
1·25	·806
1·25	·808
1·25	·810
1·25	·812
1·25	·813
1·25	·815
1·25	·816
1·25	·818
5·00	·819
1·25	·817
1.25	·815
1·25	·820
15.00	*·823
2·50	·813
2·50	·815
2·50	·813
2·50	·808
2·50	·815
2·50	·825
5·62	·821
5·00—coke.	
·63—water.	
100·00	

Total quantity within brace (·773 to ·813), 4 6–8 gallons; having a specific gravity of 809°.

* In this fraction the oil cooled to 40° Fah., became solid from the presence of paraffin.

The results of the distillation were very different from what I anticipated, and was led to believe they would be, from a table experiment, the fractions of which were too small to conveniently take. The specific gravity, and the appearance of paraffin towards the latter part of the experiment, caused me to suppose that, from the low gravity of the petroleum, and obtaining paraffin in the distillate, it was a mixture of very light and heavy fluid hydrocarbon only.

In the manufacture of illuminating oil from coal, it is that portion of the product between the specific gravity of ·775 to ·840 only, that makes in every respect a burning fluid; and in the examination of this petroleum, it was my intention to have taken the same range of gravities to test both the quantity it yielded of such, and to test them as regards the illuminating value compared with that of coal oil. It will be seen from the table of gravities above, that there was none obtained higher than ·825, at which point paraffin made its appearance; at that I concluded it would be best not to carry the quantity intended for burning fluid any further, and consequently was disappointed in obtaining a fluid having the same range of gravities as that of coal oil, with which I intended to test its illuminating value. That portion of oil that came over after the above, upon remaining out doors over night, was found to be in the morning full of crystals of paraffin. The quantity, however, is not so large as that present in coal oil of higher gravity. A slight elevation of temperature caused their rapid solution in the accompanying oil; and an attempt at the separation, at present, I found difficult, and shall, at some future time, separate them. The paraffin from this petroleum, I am satisfied, is a very different body to that obtained from coal, both in its chemical composition and physical properties. Its low boiling point, and apparent low specific gravity indicate it.

The distillation commenced with a fluid of very low gravity and exceedingly volatile, and almost colorless. As the gravity increased, it became gradually colored, and the last fractions of it were of a lemon yellow color. The odor of the whole product was similar to that of the original, but more penetrating; by exposure to light, the oil gradually acquired a dark color. That portion of the oil included within the brace, in the column of gravities, without any purification, was tested as to its burning in a flat wick lamp. At the commencement of the trial, it burnt with a full long flame, but in the course of a very short time it gradually commenced to grow smaller, and in the course of an hour it diminished to about one-third, the wick very much clogged with deposits of carbon, and giving but a feeble red light—this trial proving very unsatisfactory. The oil was submitted to further treatment, with the view of removing from it any or all substances that might interfere with the proper combustion of it; to this end the oil was re-distilled over lime, and then treated with concentrated sulphuric acid and alkali. The product after this treatment was almost colorless, and the greater portion of its original odor gone. This again was tested in the lamp, as in the first instance. The commencement of the combustion was all that could be desired, but the extent of flame rapidly decreased, and at the end of an hour the flame had fallen off to not more than a third of its original size. The only difference observable between it and the former trial, was the absence of carbon deposited upon the wick. One thing is observable during the combustion of this fluid, that the wick is rapidly consumed, and to throw the same extent of flame as obtained from coal oil, a much greater elevation of it is required. That the cause of the rapidly diminishing flame is from the shortening of the wick, is very obvious, as a tolerable extent of flame may be kept up by elevating the wick as the flame diminishes, which in domestic use, would be very troublesome and inconvenient.

The product from this specimen of petroleum, it will be seen from the above, is not in every respect a good burning fluid, as it does not give a constant flame, and rapidly burns away the wick, rendering frequent trimming and elevation of it necessary, to obtain a good illumination from it,which is a peculiarity difficult to account for. My impression is, that it arises from a deficiency of carbon, and think that an ultimate analysis would demonstrate that it contains a smaller per cent. of carbon than coal oil, or products obtained from petroleum, having a higher specific gravity. Such has been my experience in regard to petroleum, i. e., the higher the gravity of the crude material, the more valuable the products both for the purposes of illumination and lubrication.

Petroleum, compared in value with crude coal oil, as a source of illuminating fluids, is a question of much interest, and as far as this specimen is concerned, not difficult to decide. Volume for volume, it certainly yields a much larger per cent. of oil within certain gravities, than crude coal oil from Western Cannel coal. The loss in and expense of refining, is also much less than that of coal oil. But respecting the value of the true hydro-carbons, that from coal possesses, in every respect, a decided superiority.—*The Druggist, Cincinnati, June* 15, 1860.

STATISTICS OF THE INDIGENOUS ROOTS, BARKS, ETC., AND THEIR PRODUCTS.

The value of correct and reliable statistical information can not be too highly estimated; and as but few persons, even here, are aware of the extent of the trade, manufacture, and use of the medicinal plants of the United States, and especially those of the Mississippi Valley, we have compiled the following table, showing the amount of this business in Cincinnati. Our information has been obtained from the most reliable sources, and we fully believe our estimates are rather under than over the maximum quantities.

There are in this city four laboratories, at which the resinoids, extracts, and fluid extracts are manufactured on a large scale; and in addition, several of the druggists and apothecaries prepare considerable quantities of them.

In this table we have not included any articles but those actually used for medicinal purposes, and have even rejected ginseng, about 50,000 pounds of which are annually received at this port.

Table of Resinoids, Extracts, etc., manufactured at Cincinnati for the year, ending May 1st, 1860.

Resinoids,	150,000	ounces.
Extracts, Inspissated Juices, etc.,	26,500	pounds.
Essential Tinctures,	4,000	"
Tinctures, Syrups, etc.,	50,000	"

Of Podophyllin and Leptandrin, about equal quantities are prepared, and the two constitute more than one-half of all the resinoids produced.

For the preparation of the above-enumerated articles, at least 250,000 pounds of the roots, etc., are required.

The sales of the crude, bruised, and powdered roots, barks, etc., we estimate at 310,000 pounds, making an aggregate of 560,000 pounds, sold and manufactured in this city during the year; the average value of which can not be less than one hundred and fifty thousand dollars, giving employment to a large number of persons, who are engaged in the collection, drying, and manufacture of these home productions.

The cities of Pittsburgh, Louisville and St. Louis, are also largely engaged in this business; and in addition, a very considerable amount of the roots, barks, etc., are shipped from the various smaller points: and we think we may safely say, that there are not less than one million pounds of these indigenous medicinal agents disposed of annually.

This comparatively new, but valuable and interesting branch of trade, is so rapidly increasing, as to lead many to fear that unless cultivation is resorted to, the country, extensive as it is, will, in a very few years, fail to supply a sufficient quantity of some of the articles, to answer the demand.—*The Druggist, Cincinnati, June* 15, 1860.

CASSAVA BREAD, PREPARED FROM THE ROOT OF CASSAVA PLANT.

Janipha Manihot. (*Euphorbiaceæ.*)

By Mr. F. A. Davson.

There are two distinct varieties of the cassava plant—the bitter and the sweet. The root of the bitter cassava is large and tuberous, abounding in a milky juice. It can with difficulty be distinguished in appearance from the root of the sweet cassava; it does not, however, possess that tough, fibrous, and woody filament contained in the heart of the sweet cassava root. The sweet cassava root, although resembling that of the bitter in external appearance, unlike the latter, is not poisonous.

The plant of the sweet variety grows to about the altitude of four feet, the length of the root is about a foot, it is seven or eight inches in circumference, and of a lightish-brown hue.

The plant of the bitter cassava is generally six feet in height, the leaves are of a darker green, and the stem of a dark-brown color. The roots require a somewhat longer period for coming to maturity, and are much larger, being about twenty inches in length, and ten in circumference. The sweet cassava is used throughout the colony of British Guiana as a vegetable, either boiled or roasted. When boiled and mashed with fish and meat, it makes excellent soup. From the farina of this root tapioca is prepared.

The bitter variety is cultivated to a great extent by the Indians. It is from this that they produce cassireepe and cassava bread, both of which appear indispensable to their subsistence. The details of the process for making cassava bread vary in different localities. In the British colonies, the root is first washed, then grated on a board stuck with small sharp-edged pebbles or fish bones, or a coarse tin greater is used for the purpose. The Brazilians use a hand-mill for grating the roots. The roots are thrown into the portion of the mill adapted for the purpose, the handle is turned, and the grated portion falls out of an aperture beneath, into a tub or other vessel placed below for its reception.

Edwards, in his *Voyage up the River Amazon*, talks about the roots being grated upon stones. The grated portion is then packed into a matapa, an elastic basket made of wild cane (from five to six feet in length, and three to four inches in diameter), each end terminating in a handle. When sufficiently packed, the upper handle is hung on a cross-beam of the banab (Indian hut), and through the other handle is fitted a heavy piece of timber, the end of which rests on the ground. The pressure on the timber, which is generally produced by sitting upon it, causes the milky fluid to flow out from the interstices of the matap. This liquor, called "cassava water," is very poisonous, causing animals who drink it to swell to a great size, and die within a few hours. After depositing its starch, which it does quickly, it is boiled until it assumes a deepish brown color, and is of the consistency of treacle. On being boiled, the poisonous qualities (hydrocyanic acid among them) are entirely dissipated, and the liquor is known under the name of cassireepe, which is said to enter into the composition of many of the English sauces. The Indians of Guiana mix a small portion with water, and boil with it a quantity of peppers, which renders it excessively hot; into this they dip their meat and cassava bread at meals. The colonists use the cassireepe for flavoring soups, in made dishes, and in making the far-famed "pepperpot," consisting of fish, meat, or fowl, or some of each, boiled with the cassireepe and peppers.

The residue in the matapa is spread out in flat cakes, upon round iron plates of different sizes, and baked over a wood fire. The bread should be perfectly white, not suffered to burn, and when obtained, kept perfectly dry in a tin box or canister. The more civilized inhabitants of the tropics (perhaps I should be better understood if I were to call them Europeans) are not satisfied with eating the cassava as obtained after baking, but have it toasted and buttered, which greatly improves the flavor, and gives it a pleasant crispness. The grated cassava bread is often used in preference to crumbed bread, for different purposes. The bread may be obtained from both plants; but, as a rule, that commonly used is prepared from the bitter cassava root, and the root of the sweet cassava is used in the production of tapioca. The cassava bread of the Indians is much thicker and sweeter than that prepared by the colonists. The cassava is propagated by cuttings, growing to the altitudes already mentioned. Almost every leaf has one or more excrescences, about half an inch long.

Piawarri, an intoxicating liquor, is made by steeping cassava bread in water. The Indians, who are the only manufacturers, use a long narrow trough or boat, hollowed out of the trunk of a tree. In order to ferment this liquor, several old Indian squaws, almost toothless, assemble round the boat with a quantity of cassava bread, which they chew till well mixed with saliva, and spit out into the trough. In a day or two it is in a perfect state of ferment, and ready to drink. Piawarri is not commonly made as a beverage, but only on special occasions. When an Indian chief dies, he is buried in the village, and the other Indians quit the place immediately, leaving all their implements of chase and husbandry and food behind them. Twelve moons are allowed to pass over, when all the Indians of the chief's tribe assemble at the deserted village to feast and dance the "Macquarrie Whip-dance." Piawarri being prepared, a long banab is erected, in the middle of which the boat is placed with the intoxicating liquor. Each Indian marks his body over with roucou (*i. e.* annatto) and lana dyes, and ornaments head, legs, and arms with the blue, red, and yellow feathers of the parrot and macaw. Each is provided with a whip about three feet long, the plaited thong of which is made from the silk grass, ornamented with small bunches of dried dyed grass; this is called the "Macquarrie whip." When sufficient numbers have assembled, and the sun has sunk behind the trees, the dance commences. They arrange in two opposite lines, as for a country dance. One commences, and after a few manœuvres, firmly plants one leg forward. The opposite Indian takes quick aim, and with his whip lashes the calf of the leg, frequently inflicting a deep cut; each Indian dances thus down the middle, presenting his leg to every Indian present for the lash. When excitement and howling are at its height, one leads off to the piawarri boat, and they dance in single file round and round, the women filling calabashes with piawarri, and presenting it to the men. The dance lasts sometimes for three days and nights. The evil spirit is supposed to be driven away from the chief's grave. The Indians return to their homes, and never again go back to the spot.

Having been some years absent from the colony, and having left at too early an age to take much interest in the produce of my birthplace, in a commercial point of view, I do not know whether cassava bread is imported commercially into this country; I am, however, inclined to suppose it is not, from never having met with it at all in England, nor heard of its exportation from the British colonies; and my familiarity with that tropical staff off life was only renewed last week, when a box of it was brought over for private consumption from my home in Berbice. The cakes were closely packed in a deal box, and covered up in brown paper; they arrived, after three weeks' voyage, perfectly white, in excellent condition, and in every respect equal, doubtless, to what is produced every day in the colony. A few years before I left the colony a few pounds of the dried sweet cassava root were sent over to England from Jamaica to ascertain whether it would prove profitable, if greater amounts were exported, as articles of commerce. Some of the specimens were perfectly white; in others, however, the worms had made some way in their repast before they arrived in England, and the greater number of samples were scorched and burnt by some accident or carelessness. This was hardly a way to procure custom. Had good specimens of the bread, as it should be prepared for the table, been sent over, the article undoubtedly would have met with a more welcome reception. It is not, however, too late to try the experiment again, the more especially as the specimen recently imported is everything that can be desired. The bread, being abundant, is cheap, and may be purchased at the rate of fourpence for a dozen cakes. It is also light, farinaceous, and pleasant to the taste, and altogether worthy of obtaining a high place among the luxuries of the English tea-table.

I have no doubt but that when emigration becomes more a matter of consideration in this country, and Europeans begin to believe that British Guiana is not such a seat of slavery and yellow fever as is commonly supposed, and when we gain the labor, which is all that is required, and when the produce of that territory is brought more before the British public than it has hitherto been, the colony will become a very important one; for there are many products of that fertile land, of which the European knows little or nothing; some he may know by name, and of others he has only seen small samples. No country on the surface of the globe can be compared with Guiana for its vigor and luxuriance of vegetation. There is a constant summer, and the rich soil, humid climate, and congenial temperature, insure an immense and rapid growth of vegetation, and a continued succession of leaves, flowers, and fruits. But I must not stray from the subject of the cassava to other products; for I should be led away to numbers indefinite, of which my faint recollection has but left me a limited knowledge. As I am, however, likely to return to the colony, I hope to be one of those who are doing their utmost to bring the products of the West before the public of this country.—*London Pharm. Journ., July* 2, 1860.

ON THE DETECTION AND ESTIMATION OF PHOSPHORUS AND PHOSPHOROUS ACID.

By Prof. Scherer.

Within two years the author had occasion to gather much experience from a number of cases of poisoning of animals, and of two men, also from several attempts of poisoning by phosphorus. In one case, the phosphorus from 30 to 40 matches, equivalent to about ½ grain, proved fatal to a woman in 48 hours. He establishes the presence of phosphorus by Mitscherlich's method, with the modification of filling the apparatus with carbonic acid, generated from a few pieces of calcareous spar introduced into the acid liquid. No luminous vapors are obtained, but little of the phosphorus is oxidized, and if the tube dips into distilled water, this is phosphorescent when agitated in the dark, and its vapor blackens nitrate of silver.

To estimate the phosphorus, the last bottle containing the water, is connected with another vial containing either neutral or slightly ammoniacal nitrate of silver, which absorbs all the phosphorous vapors that have not been retained by the water. Any globules of phosphorus which may have been obtained, are fused together and weighed; the water is added to the silver solution, nitromuriatic acid is added and then evaporated, the chloride of silver is filtered off; the phosphoric acid, which is contained in the filtrate, is estimated in the usual manner and calculated for phosphorus.

Very minute portions of phosphorus may be recognized, after first ascertaining the absence of sulph-hydric acid, the vapors of which will turn sugar of lead paper black, and paper moistened with nitroprusside of sodium blue; papers moistened with nitrate of silver are suspended over the acid liquid, which is gently heated; in the presence of phosphorus, the silver will be reduced with a black color. The papers may now be macerated in chlorine water or aqua regia, the filtrate will, after evaporation contain phosphoric acid, to be recognized as ammonio-phosphate of magnesia, or as phosphomolybdate of ammonia.

If phosphorus has been wholly or partly converted into phosphorous acid, the residue from the first distillation is heated in Mitscherlich's apparatus with sulphuric acid and pure zinc, until the hydrogen ceases to be contaminated with phosphuretted hydrogen, which is conducted into the silver solution and estimated, as indicated before.—(*Annalen d. Chem. und Pharm.* cxii. 214—220.) J. M. M.

DEATH FROM AN OVERDOSE OF CHLOROFOM.

An inquest has been held at Doncaster, on the body of Frances E. N. Mansell, wife of a commercial traveller in that town. The deceased had been for years in the habit of taking chloroform ; and notwithstanding that both her medical attendants and her husband had used all means to prevent her obtaining it from the druggists, she was supplied with no less than five ounces on one occasion. She used an ounce at a time, and on each occasion she went to bed, her daughter, only ten years of age, attending upon her, and removing the cloth (upon which the chloroform was poured) from her mouth when she thought she had inhaled sufficient. The deceased took the last dose at ten o'clock, having procured it a short time before, and at eleven o'clock the children, who were alone in the house, found her dead. From the examination of witnesses, it was shown that the deceased had procured the chloroform from Mr. Martin, druggist, against the wish of her friends. The jury returned a verdict that the deceased had died from an overdose of chloroform incautiously taken, and they further added, "The jury cannot separate without strongly censuring Mr. Martin for persisting to supply the deceased with such a dangerous agent after the repeated warnings of Mr. Moore, one of the medical men, and Mr. Mansell ; and the jury further recommend that in any future bill for the sale of poisons, chloroform be included under the same restrictions as other poisons."—*London Pharm. Journ. July*, 1860.

ROTTEN STONE.

This is a useful yellow-colored substance much employed in scouring brass and tin by mixture with a little sweet oil, then finishing off with some dry whiting. Very few persons know where it comes from, or of what it is composed. According to Professor Johnstone, it is composed of silica, alumina and carbon. It is obtained from a ridge in Derbyshire, England, which is covered with drift 10 or 20 feet thick, consisting of brown clay, with manes of black marble, chert, and rotten stone. The rotten-stone is so soft whilst in the soil that the spade goes through it readily, but it hardens on exposure ; the holes from which it is dug are only two feet deep in some places ; at others, from six to eight. On examining a series of specimens, Professor Johnstone found that while some were homogeneous, others had nucleus of black marble. He then treated specimens of the black marble with weak acid, and found that on the removal of the carbonate of lime, there remained from 15 to 20 per cent. of a silicious substance perfectly like the natural rotten-stone. He concluded that there existed in the soil some acid which penetrated it and dissolved out the calcareous matter of the rocks below. The agent in this case might be the carbonic acid of the air, brought down by rain ; but there were instances not capable of explanation by this agency alone, and attributable to other acids, which are produced under certain conditions, and exercise a much wider influence. The bottoms of peat bogs present very strong evidence of the action of acids; the stone and clay are bleached and corroded, only silicious and colorless materials being left. The source of the acid here the same as in the former instance ; the vegetable matter growing on the surface produces in its decay substances which exert a chemical action on the subsoil, and escape by subterranean outlets, carrying away the materials dissolved in their progress. Another instance was afforded by the mineral Pigotite, formed in the caves of Cornwall by water dripping from the roof. This water contains a peculiar organic acid, derived from the soil of the moors, which dissolves the alumina of the granite and combines with it. The organic acids are very numerous and different in composition, but agree in producing chemical action upon rocks. They are produced over the entire surface of the earth, especially over uncultivated tracts, and are the means provided by nature to disolve the mineral food of plants; they are also amongst the chief causes of the exhaustion of soils. In the green sandstone strata of Surrey, England, known as "firestone," the rock is light and porous, and contains silica in a soluble state. Common sandstone quartz or rock crystal is not acted upon by potash or soda at ordinary temperature, but 30 per cent. and sometimes 70 per cent. of the silica in "fire stone" may be dissolved. In all such cases the silica must have been originally a state of chemical combination with lime, alumina, or something else, which has been subsequently removed. The silica in the rotten stone was soluble, but black marble, in a bedded state, never was found converted into rotten-stone—*Chemical News, London*, July 30, 1860.

COPPER TUBES MADE BY GALVANIC PROCESS.

Le Génie Industriel, publishes the details of a process for making copper tubes without soldering, which consists simply in depositing copper upon lead patterns by the galvanic battery, and then melting out the lead. It is said to work perfectly, and of course tubes could be made of any desired form—straight, curved, or right-angled. This suggests the idea of forming tubes in the same manner with cores of wax or clay. The clay may be forced into the size of the pipe through a draw plate, then allowed to harden slightly, when it may be covered with plumbago and an electro deposit of copper made upon it with a galvanic battery. When the copper is deposited in sufficient thickness the clay may be removed from the interior by boiling the pipe in water. To conduct this manufacture it would require long depositing troughs, and the expense would probably be too great for making strait copper tubes; but for curved tubes, such as the worms of stills, it would perhaps pay. Curved copper tubes are commonly made by filling strait tubes with hot resin, then twisting the entire tube into its curved form. When the resin becomes cool, it is driven out by striking the pipe, which breaks the resin core into small pieces.—*Chem. News, London, May 12th*, 1860.

NOTES ON SOME OF THE DRUGS OF THE LEVANT.

Madder.—Asia Minor, at the present time, produces annually about 60,000 sacks of madder roots, the average weight of which is usually two and a half cwts. each. The principal districts of production are Bakir, Cayagik, Demirgik, Yordes, Caramania, and Allazata. A small quantity also is grown in Syria and in the islands of Imbros and Cyprus. The qualities most esteemed are the Bakir madder roots. These are generally of a bolder and brighter color than the others. Those of Allazata and Cayagik are also of excellent quality. Syrian and Cyprus are the most inferior kinds. But wherever they are grown in Turkey, the roots are forwarded to Smyrna, where they are garbled and packed by means of hydraulic presses into bales, which weigh from six to seven cwts. each.

The crop this year is estimated at about 50,000 sacks, but the quantity is in some measure regulated by the prices. When the prices are low the growers refuse to dig up the roots, and high prices will sometimes encourage them to dig when the roots are only two years old. It is, however, most advisable to allow them to remain in the ground from three to four years, according to the sort. The present value of Bakir roots in Smyrna is 46*s.* 6*d.* per cwt. and of other kinds from 39*s.* to 45*s.* 6*d.* per cwt.

Persian Berries.—The yellow berries, usually termed Persian berries, are grown in Cæsarea; the cultivation, however, is now nearly abandoned, and in a few years the article will probably disappear from commerce. The present price of 38*s.* to 44*s.* per cwt. hardly covers the expense of carriage from Cæsarea, and the heavy duties and tithes, which, although supposed to be *ad valorem*, are levied upon the old price of 7*l.* to 8*l.* Some years ago well grown Persian berries were worth 28*l.* per cwt. The quantity still brought to the Smyrna market is about 1500 sacks annually. The berries are now collected by the peasants on account of the landed proprietors, they receiving in payment one half the quantity.

Opium.—This narcotic is now being collected. The crop this year is unusually large, and is expected to reach 3600 baskets, of about 140 lbs. each, the average production being 2500 baskets. No price has yet been fixed, but it is expected that 18*s.* per lb. will be about the figure at the commencement of the season. The average consumption of different countries is as follows :—

England	400 baskets.
America	900 "
China	1000 "
Java	500 "
Borneo	100 "
France	80 "
Germany	60 "

The above figures, however, vary considerably according to price, particularly with regard to the exports to China.—*Lon. Chem. News, July* 7, 1850.

Varieties.

Vegetable Tallow.—The Agricultural Bureau of the patent office has received specimens of vegetable tallow, known to botanists as *myristica sebifera.* It comes from a nut about the size of a nutmeg, full of meat, which being melted, becomes a yellowish tallow excellent for candles. The plant is a native of Central and South America, and naturally attains a height of 10 or 12 feet; it carries herbaceous flowers from July till September, and makes so profuse a secretion of oily matter, that this may be readily obtained from it, in the form of fat, by immersing it in boiling water. H. L. Clarke, Esq., United States Minister at Guatemala, writes that he has no doubt that this article might be collected and exported at considerable profit. It grows in immense quantities in the southern departments and in Verapaz. It is susceptible of such high purification as to resemble the finest sperm, is solid, and quite as transparent. A sample of this production, in the nut and in the tallow, is now among the numerous collections at the patent office. The cultivation of it from the seed will be tried at the horticultural garden.—*Chem. News, London, June* 2, 1860, from *Scientific American.*

New Way to discover Leaks in Gas Pipes.—The usual way of looking for them with a lighted candle our readers know sometimes results in an explosion, a fire, and one or two deaths. Now M. Fournier suggests another way, which is very simple, and perfectly safe. He charges the pipes with ammoniacal gas, and then goes along them with a bottle of hydrochloric acid. Our readers know the rest. M. Fournier claims one of the Monthyon prizes for his invention.—*Chem. News, London, June* 23, 1860, from *Cosmos, Liv. xix.*, 1860.

Cast Platinum.—At the last sitting of the Academy of Sciences, MM. Deville and Debray exhibited two ingots of platinum weighing together a little over 55 lbs. av., which had been melted in the same furnace, and run into an ingot mould of forged iron. The furnace used was that described in the Chemical News, Vol. 1, page 6. The authors announce that platinum may be melted in any quantity, and once melted it behaves precisely like gold or silver, requiring exactly the same precautions as in casting the precious metals. They also exhibited a platinum cog-wheel, cast in an ordinary sand mould, in the same way as other metals, thus giving a new proof of the possibility of giving platinum all the forms that may be desired by their process.—*Chem. News, London, June* 23, 1860.

Gas Leakage Nuisance.—It is reckoned that about 386,000,000 of cubic feet of gas escape per annum in the metropolis—or, in other words, that about 1,000,000 cubic feet a day of that delicious vapor is let loose in an unburned state upon London society. Some authorities reckon the quantity at about 2,000,000 feet per diem. The loss in hard cash comes up to about £50,000 per annum.—*Am. Med. Times, New York, July* 14, 1860, from *Med. Times and Gazette.*

Glycerole of Kino.—Dr. William S. Love has handed us a specimen of the above preparation in the proportion of two drachms of kino to the fluid ounce of glycerin. Dr. Love suggests this preparation as a substitute for tincture of kino in cretaceous mixtures: it mixes readily with water, forming a transparent solution, and seems to be a permanent preparation, as he has kept it for a considerable length of time without apparent change.—*Jour. and Tr. Md. Col. Pharm. March,* 1860.

Ginseng.—A letter from St. Petersburg, dated 24th December, states that a scientific expedition has been organised, under the direction of M. Maak, to describe the interesting valley of Oussory, as well as the south-east of the Mantchoo territory to the frontiers of Corea, and to examine specially the ginseng (a renowned medicinal plant,) to study the geographical extent of the Mantchoo territory where this plant is propagated, and particularly the places in which it grows naturally, and to examine and describe the plantations of the Chinese who cultivate it. A great number of Russians propose to establish plantations of ginseng as an important produce for trade with China.—*Pharm. Jour. London, Feb.* 1, 1860.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—This important body will convene this year in New York. So far as can be now judged, the indications are favorable to a large and interesting meeting. It is desirable that members should make a little sacrifice to get there, and those who are not members should take advantage of this opportunity to join the Association, to mingle with our New York brethren, and visit the attractions of the great commercial metropolis. The following is a copy of the Treasurer's annual circular:

Boston, August 11*th*, 1860.

The next meeting of the Association will be held on the second Tuesday of SEPTEMBER (11th), 1860, at 3 o'clock, P. M., at the Hall of the University Buildings, on Washington Square, New York City.

The LAFARGE HOUSE, 673 Broadway, convenient to the Hall, has been selected as the rendezvous of the Association, when not in session, and the home of those not residents of New York, ample accommodations for the purpose having been secured by our New York friends, at a reduction from usual rates.

All members, and persons intending to become members, are requested to report themselves at the Hall of the University Buildings, Washington Square, and at the Hotel,

Members are requested to forward the names of their friends whom they wish to propose for membership, so that they may be elected at the first session of the next meeting.

Members will confer a favor by notifying the Treasurer of the decease of any member during the last year.

Suitable arrangements will be made for the exhibition of specimens at the meeting.

From the manifestly increasing interest in the Association, a large attendance is expected, and it would be very gratifying to meet every member, and all Pharmaceutists who are interested in our objects.

ASHEL BOYDEN, *Treasurer*,
Myrtle, cor. Joy Street, Boston.

DR. COATES' ADDRESS.—In noticing a part of this Address, as our record will show, we did not intend, much less expect, to excite the display of feeling and asperity manifested in the following letter. The author, wholly misunderstanding the tenor and spirit of our criticism, has allowed himself, we fear, to be influenced by the spirit that he fancied had dictated our remarks; and no doubt honestly feels himself aggrieved. As we hate injustice, and do not like even to be misunderstood as countenancing it, we are induced to admit the letter to our pages, (much against our sense of its necessity,) as the author has desired it: but we accompany it with the statements—1st, that there is but one editor of the American Journal of Pharmacy; 2d, that it has not been usual with us to send copies of our Journal to authors of reviewed books or articles, unless requested, and hence we did not intentionally neglect Dr. Coates; 3d, that our remarks were directed to the subject matter of the Address, without any unkind feeling against the author, and that we have no where attributed "*improper motives*," or have spoken disrespectfully of him, or given just cause for the sharp language of his reply.

With these necessary explanations, and without feeling it needful to alter our record, or to enter into any defence, we submit the letter to the perusal of such of our readers as feel disposed to occupy themselves with it, believing that a due appreciation of the ejaculation of the poet,—

> "O wad some Power the giftie gie us
> To see oursels as others see us!
> It wad frae monie a blunder free us
> An' foolish notion,"

—would have saved the author much irritation and "vexation of spirit," and have given our readers full five pages more of profitable "Varieties," which have necessarily been excluded.

To the Editors of the American Journal of Pharmacy:

Gentlemen,—I am induced to the unusual course of replying to a review by circumstances which seem to call for it, and to make the case exceptional; and these I now propose to enumerate.

Such replies, no doubt, are often a waste of labor, or worse; but it appears to me that I have been held up to the apothecaries of Philadelphia, in your recent May and July numbers, as disrespectful and inimical to them, and as using strange liberties of language in speaking of them. Against this I feel the strongest cause to protest, both from natural disinclination to place myself in such a position, from my numerous and valued friendships within the pharmaceutical profession, and from the palpable absurdity of an individual, who obtains his livelihood by the practice of medicine, being willing to make enemies of the apothecaries of the city in which he resides. The call for a reply is, however, rendered still stronger. Direct personal imputations of "excessive professional pride," of a claim to "infallibility," and of an "extraordinary" and "singular" character in a recent address of mine, and in its "language" and "expressions," and of a "liberty" taken in using them, are not enough; but a positive and plain assertion is made of the existence of *improper motives*. All this is brought against me by name, and in reply to a paper which in no instance alludes to individuals personally, or gives any clue by which to identify them.

It seems to me that all the instances cited in my address are handled with tenderness and reserve—at least, it was intended that such would be the case. The effort at delicacy seems to me to be more than was necessary; and I think that some of the instances, at which the address has only laughed, might be made the subjects of a graver censure; the milder form being preferred, as more becoming to citizens, to persons devoted to justice, humanity and science, and to gentlemen.

There was no copy of either of the two reviews sent to me, although an old friendship subsisted between the principal editor and myself; and I am indebted to other pharmaceutical friends for the opportunity of reading them, and even for a knowledge of their existence, and of the times at which, some ten days previously, they had appeared. I hope he received, in due time, the copy of the address which I placed for him in Blood's Despatch, and by means of which I have supposed the reviews to have been written.

The vehemence and harshness of this attack have the more surprised me, as the present is the only instance in which any opinion condemnatory of the address has reached me; and I have even had the pleasure of receiving messages from some of the parties blamed in it, which communications, with limited exceptions, declared to be "of course," are highly complimentary. I have two letters in relation to it from another city, and, as I have reason to believe, from highly competent pharmaceutical sources, and not, as yet, a word of blame. The Society did, certainly, not only "order" the pamphlet to be published, but direct an extra number of copies to be struck off for distribution, avowedly because the members were pleased with it.

Neither can I see why the thunders of denunciation should be levelled with such intensity at me, when, in the same two numbers of the Journal, there are reviews of three criticisms on the restrictions necessary for apothecaries, the one by an author who is named, the other by the legislatures of two States; and in neither of these is there any indignation exhibited, either against the members of another profession, that of the law, or against those with whom we practise so much freedom of speech, our public servants, the law-givers. Is the distinction made against me because I live in the same city? Or is it because I am a physician, and the reviewer believed that his acknowledged labor and abilities had placed the pharmaceutical profession at a "status" superior to that of the medical body, and made it unbecoming for the latter to criticise it at all? Or, was it from some other consideration, which pointed at the present writer as one whom it would be advantageous to attack, and who would be unlikely to retort?

Mr. William Procter, Jr., appears as the responsible author of these two reviews. By his name I have been accustomed to believe that I was reminded of not only a personal friend of many years' standing, but an individual, learned, accomplished, loving truth and science, and endowed with entire delicacy and hatred of injustice. I am still at a loss, after re-perusing both of his reviews and my own paper, to discover the faulty language of which I have been guilty; or in what it is blamable to "speak thus" of the apothecaries of Philadelphia; unless, indeed, the reviewer thinks it improper in me to criticise them at all.

The only suggestion of improper language which I have either thought of myself or heard intimated, in my inquiry, by apothecaries of my acquaintance, as alluded to here, apply to the use of the word Jeshurun, and to the winding up of the remarks about the assault which I conceived to have been made upon a physician in a case which had attracted the attention of the public. I fear some of my critics are not profound in their Bible studies. Jeshurun, in my dictionary, means "the righteous people," or "the upright people," and is applied to the chosen race of Israel. In the other instance, if I used a Scriptural expression of very solemn context, in speaking of the successful defence of a physician whom there was no cause to suspect, the expression was prompted by indignation at what I apprehended to be attempts habitually repeated to throw responsibility, blame and permanent suspicion upon the physicians, whenever such things occurred; both as a gratification of malignity against better, more scrupulous and more painstaking men, and as a convenient mode of directing the public attention in the direction of people likely to suffer in silence, while the offender might persevere with less labor and no sacrifice, in the pursuit of money.

Yet, when Mr. Procter goes into the analysis of his objections to the address, it is pleasant, nor without some surprise, after such an exordium, to find that he agrees with me in a number of the opinions which I really entertain. Of the questions proposed for consideration by the reader, he omits twelve, quotes seven, and, of these, answers three in the affirmative and two in the negative. Thus, in regard to the use of Latin in naming drugs. to the comparative claims of all well-educated young men, and of those individuals with whose ideas, choice of articles to be used, and degrees of preparation, the practitioner is acquainted, to the easier inspection of a limited number of establishments, to the preference due to those who practise attention and care, and to the moderate limits of the number which the city can support without intermixture of other species of commerce, I feel no occasion to express much dissent from what he alleges.

Yet, although the ignorance or imperfect knowledge of Latin among both our physicians and apothecaries, renders it proper, as was agreed by the practitioners of a preceding generation, to write all directions for family use in English, though addressed to the apothecaries; and although the being united with physicians in the confidential secrecy of a dead and learned language was probably one of the most powerful means which inducted the apothecaries of England into the practice of medicine, yet Mr. Procter ought to acknowledge that any prohibition of the older language is essentially wrong. The power and right to communicate in the language of medicine, ought to be preserved. This negligence of Latin, and introduction into the pharmaceutical and medical professions of unprepared men, is confined, I believe, to the Anglo-Saxons. It is said to have arisen from insuperable difficulty. To achieve what is impossible ought not to be demanded of any man; but the error consists in suffering men who have not overcome a given difficulty to be passed off among those who have done it. With regard to the medical profession, our State Society is engaged, at this moment, in efforts to remove this cause of censure.

To another of the reviewer's decisions, I qualify my assent. In limiting deviations from a trade claim to supply particular parties, the expressions "except in special cases," and "without good reason," may be understood to cover a great deal of ground. Who is to select the cases and decide on the goodness of the reasons? I am under the impression that, as in one of the instances cited briefly in the address, the physician has been held to defend himself before the judgment of the apothecary in his own case. The truth is, that the proper motive in the transaction is the welfare of the patient; and that this claim, as now used and as urged here, is a part of the attempt to subject a conscientious and scientific duty to the laws of trade; to the objections against which, in the much-censured address, I feel obliged still to adhere. It is not just to say that, when we send from one establishment to another. the inference is conveyed, "that the apothecary does not understand his business." It is notorious that the apothecary does not, and perhaps cannot, keep all the best articles; and that these may often be obtained in particular localities. It is also true that some apothecaries, more than others, abstain from levity and talk while putting up drugs, and from the sale of non-medical articles.

With regard to "motives," I think sufficient such are obvious. The paper was read before a medical society; and on the Events of the Year.

one of these which had most interested and agitated the public and pained the medical mind, was a recent occurrence at an apothecary's store. Things of this kind have seldom reached my ears for a long time past, without being used as the occasion to make furious attempts to throw the blame upon physicians. In this instance it gave rise to an earnest and persevering one, from which I had to dissuade a valued friend of my own, to induce the Legislature to prohibit the use of the Latin language in prescriptions. He who runs may read that there was here understood and favored a belief in the minds of the public that physicians were to blame in the matter, and that a pompous false pretension, conducted by the use of Latin, was what had produced that and similar occurrences. I need not ask, certainly, how this could be with truth omitted in treating of the medical events of the year.

As Mr. Procter says, "it would not, perhaps, be difficult" to take up other illustrations; but, not feeling inclined to exhibit myself as an adversary of the apothecaries of the city, I will confine this branch of the discussion to the examples which he has given me himself. In these same reviews, there occur a long string of insinuations against physicians. These are exactly cases in point. If the humble individual who now addresses you be ever so much in the wrong, does that give the reviewer any right to retaliate upon other and unoffending men belonging to the same profession? In defending apothecaries, he takes occasion to instruct the public upon the ignorance, carelessness and negligence of physicians; and plainly intimates the position, somewhat incompatible with his present alleged exposure, that the apothecary is bound to exercise a paternal superintendence over our prescriptions, in order to protect not only our patients, but our own characters. The reviewer's opinions on this point ought certainly to be well digested, as he has chewed the cud on them to much extent in his criticism. The idea, however, of violation of confidence, does not seem to have occurred to him.

Let me not be misunderstood. I do not know who those are who "hold that the prescription is always a sufficient warrant 'to blindly dispense' it according to the letter." It is a part of my demand that they should be more carefully examined than they are. Besides being made the occasion of improprieties by some apothecaries, they undoubtedly often contain errors themselves. I will not hold myself responsible for omission of duty, on the part of boards of examiners, who may have granted diplomas without requiring adequate preparation; I will not inquire whether this has never occurred within the more limited circle of the College of Pharmacy. Prescriptions are almost always written under agitation and interruption in families. I am well aware that there is a common-sense, scientific and citizen-like way of acting on this subject; and that it is a thing of strong moral obligation. I only object to airs of superiority, to going out of our own departments of duty, and to that vanity so often mistaken for the loftier sin of ambition, and which so generally leads to "vexation of spirit." The wisdom of antiquity is not of the less value because it is included in the canon of the Christian Scriptures.

It ought to be recollected that where a course of study is so extensive and diversified as that of medicine ought to be, where the members of another profession contract to take the chemical and pharmaceutical part of it off their hands; when chemistry itself has become inexhaustible by any single human brain, and where the principal and prolonged labor ought to be expended upon the human body and its changes, and there is no leisure to spare for unorganized matter, it is not our duty to be so well acquainted with chemistry and the other pharmaceutical adjuvants as it is that of apothecaries. The error in naming a drug driven out of use for its acrimony and the variability of its composition, must be confessed to be a just occasion for a small triumph. I never pretended to have an apothecary's familiarity with the mineral salts; and had more of it when, many years ago, I was placed by their then organization as apothecary to the Pennsylvania Hospital, than I have now. The error in memory arose from my having been engaged in introducing, as I did introduce, the precipitated black oxide of mercury into practice in Philadelphia. See paper by Thomas Evans, in an old number of your own Journal of Pharmacy. I then made, tried and relinquished the ammoniacal precipitate from calomel. But which is the more important error, to call a well-known and discarded drug a triple chloride instead of a triple nitrate, or to cause the acrid and uncertain article to be introduced into a sick person's stomach, instead of a mild and uniform one? I grant the critic the advantage that this was, at some time and by somebody, called black oxide, (Merat & De Lens, iii. 364;) but the condemnations in the same page are abundantly sufficient to more than justify the advice to avoid it, given in Coxe's and later Dispensatories. I am certain, at any rate, that I never named any person injuriously, or attempted to lower any person's reputation about it.

From a recent document, I learn that keeping an apothecary's establishment is a "branch of the art of healing." Is making spinning jennies a branch of the cotton manufacture?

The reviewer's censure of the hoaxes practised by members of his own profession, in pages 380 and 381, may be just or otherwise. Of these he is a competent and fitting judge, and I am none whatever.

I nowhere deny the negotiation with the Country Medical Society. Being merely President for the year, and this affair having transpired several years before, at a time when I gave my whole time exclusively to my own affairs, I could not remember unimportant circumstances, which very probably occurrred in my absence. On re-perusal of the authentic documents, the imputation implied in the address, of a fidgetty desire to speak in a dictatorial style to physicians, I confess, still appears to me to be correct. It is not worth while to debate about the difference between "ought to" and "should."

Mr. Procter winds up with apprehensions of disaster to "Philadelphia Pharmacy, if it was regulated by the views of Dr. Coates." As, in the whole address, I have given no views of regulation at all, but only related occurrences and proposed questions for consideration, I do not see how he could state the question, or how he could find out what my views are, when I never expressed any. If we lived in a vulgar era, I should ascribe this to the reviewer's imagination; but in the present day of spiritualism and other illuminations, an old fogey like myself cannot assume that responsibility.

In fine, though Mr. Procter introduces motives, I shall not retaliate by impeaching his own; but I will beg him to examine himself. in order to become certain whether there may not be an unconscious impulse to all this personality and severity, and whether it has nothing to do with sectarian animosity.

B. H. Coates.

The Sunday Closing Movement in Philadelphia.—Some time last spring several young pharmaceutists determined to call a meeting of their fellows, and ascertain whether any steps could be taken which would induce their employers to agree to some arrangement by which their stores could be closed on Sunday, except at certain hours necessary for the supply of the sick. After several meetings at the Hall of the College of Pharmacy, it was determined to draw up an address to the proprietors, asking their attention to the subject, and requesting their signatures to a call for a meeting of apothecaries, at the College Hall, to consider the subject. In this they were successful; the subject met with much interest from a number of pharmaceutists, and at an adjourned meeting held on the 25th of July, the following hours for opening and closing their stores on Sunday were agreed upon by those present:

In the morning, open until 9½ o'clock.

In the afternoon, open at 1 and close at 3 three o'clock.

In the evening, open at 9 and close at 10 o'clock.

It was also agreed that the arrangement should remain in force for three months, commencing after the first week in August, and if found practicable to be continued. Meanwhile the following Address, which was approved by the meeting, was ordered to be extensively circulated.

Address of the Pharmaceutists, to the People of Philadelphia.

The undersigned address you on behalf of the Pharmaceutists of Philadelphia, convened agreeably to public notice July 18th, 1860, to consider and perfect a plan for the relief of themselves and their assistants, from unnecessary labor and confinement on the Sabbath.

The business of the Pharmaceutist involves a constant confinement to the store, required by no other pursuit; besides the ordinary motives of competition, we are under a supposed necessity to provide at the moment for every real or imagined exigency of sickness, so that the dispensing stores in this city, are open on an average from sixteen to seventeen hours daily throughont the entire year, besides being supplied with sleeping accommodations, from which the proprietor or a skilled assistant may be summoned at any time during the hours necessarily appropriated to sleep.

From this onerous confinement to business, there has heretofore been no cessation on the day set apart by the laws of the land, aud the practice of nearly all Christian sects, for rest and religious observance. A few pharmaceutists impelled by a sense of duty, have refused to attend to all calls except those of obvious necessity, and a few have absented themselves during the hours of public worship, but the common practice has been to open the stores during the whole day aud evening, thus inviting calls of every description, and effectually blotting out the Sabbath from the week of those compelled to be in attendance.

This most unreasonable custom has become almost universal, because its alleged necessity has not been questioned; recently, however, through the general awakening of discussion among pharmaceutists, both in this country and Europe, a professional spirit has grown up which has subjected this and many other abuses to a thorough scrutiny. It has been ascertained that the excessive confinement now complained of, though common in many large cities, is not found necessary in smaller towns, where a few hours only are allowed on the sabbath for the purchase of necessary articles.

Few families in any community are without some of the more important medicines adapted to cases of sudden illness, and which are especially liable to be needed at night, while none in the cities are so isolated as to be unable to obtain them from a neighbor, when the pharmaceutical stores are closed.

Under the earnest conviction that it is a duty we owe to ourselves and assistants, to secure to the fullest extent compatible with the responsible duties of our profession, that immunity from business which almost the whole community enjoys on the Sabbath, and having obtained the written concurrence of so large a number of the leading pharmaceutists of this city as to make the movement a general one, we have resolved to close our stores, after the first of August next, on the first day of the week, except at the following hours, fixed with special reference to the known requirements of physicians and the public:

In the morning until 9½ o'clock,
In the afternoon from 1 to 3 o'clock,
In the evening from 9 to 10 o'clock.

We trust that this arrangement, which for a few months will necessarily partake of the nature of an experiment, will be acceptable to all concerned, and that it will be cordially entered into in good faith by pharmaceutists generally.

In order to secure its success, and that no disadvantage may result to our customers, we request all to procure in advance those medicines they are most liable to require during the short intervals in which the stores will be closed, and as far as possible to accommodate themselves to the hours above indicated; and to remove still further the possible disadvantages of the arrangement and acquit ourselves of any desire to escape the necessary duties of our profession, we invite customers in cases of urgent necessity which are liable, though very rarely, to occur, to make application at the residence of their Pharmaceutist, or during the appropriate hours, to seek him, as is sometimes necessary in the case of Physicians, at the place of worship to which he resorts.

To medical practitioners we confidently appeal for encouragement in this reform. Their unremitting labors in a profession kindred in its objects to our own, make them acquainted with the peculiar difficulties and dangers which beset our laborious and confining pursuit, and we trust that they will willingly aid this effort to test the practicability of a measure designed to promote the physical and moral well being of those to whom are entrusted so important a department of the healing art.

Finally fellow citizens, having based this movement mainly upon the grounds of justice and expediency, claiming only a share in that day of rest provided by the beneficent laws of our State for "the ease of creation," we cannot forget that there are many who place the obligation to abstain from unnecessary secular employment on this day, on the ground of paramount religious duty; and on behalf of these we claim a still higher consideration and willing acquiescence in the full exercise of conscientious convictions, which, regardless of theological differences, all are bound to respect.

Edward Parrish, No. 800 Arch street.
J. C. Turnpenny & Co., 10th and Spruce sts.
Fred'k Brown, Jr., 9th and Chestnut sts.
J. P. Curran, 6th and G. T. Avenue.
Geo. C. Bower, 6th and Vine street.
Wm. M. Reilly, cor. 2d and Wharton sts.
Henry Mullen, Market and 33d streets.
Wilson H. Pile, Catharine and Pass. Av.
Committee.

The importance of this movement is not to be doubted; the necessity of some reform in the old arrangement will hardly be questioned; yet we do not believe the plan adopted is the best one, or that it will succeed finally, after a trial at all seasons. We believe that the periods of closing will eventually have to be decided by an understanding between physicians and apothecaries, because it really depends on the co-operation of the former, whether the times set for keeping open will meet the influx of prescriptions after their morning and evening visits. We believe it would have been wise, therefore, to have invited the co-operation of the physicians, so far, at least, as to get a general expression of approval of certain hours. Beyond this a provision should be made for emergencies, by dividing the city into districts, in each of which one apothecary should be open the whole day; the apothecaries of each district taking this duty in some regular order so as to make it but moderately onerous. There are some stores that may enter into this arrangement without any inconvenience to their customers, whilst there are others, whose range of prescription dispensing is very large, that cannot do so at all in its present hours. All these points should be consideredwith an honest purpose of doing the right thing; and above all, let those who feel zealous in the cause of the Sabbath be careful how they judge hastily of their brethren, whose views in regard to duty in this matter may differ from their own.

Since writing the above, we are informed that another meeting is called for August 30th, to re-consider the subject, as, even in the short time that the arrangement has been in operation, difficulties have arisen, which, unless overcome, will defeat the object of the movement.

Pharmacy in Lower Canada.—A member of the Canadian Parliament has introduced a bill for "An act to regulate the time during which Apothecaries and Druggists' shops shall be kept open in the different cities of Lower Canada." This wise legislator wishes to *compel* the apothecaries to keep open shops from 6 A. M. to 9 P. M., from April to November, and from 7 A. M. to 9 P. M., for the remainder of the year, with other analogous regulations applying especially to Sunday. As the *British American Journal* observes: "We wonder that the author of the bill has not gone a step further, and prescribed the particular dress with which the apothecaries should decorate their persons, and the hours during which they should take their meals". The apothecaries in Montreal, have deliberated upon the subject, and at a meeting held on the 24th ult., John Carter Esq. in the chair, the following resolution was unanimously adopted:

"That having carefully considered the act now before Parliament, entitled 'An Act to regulate the time during which Apothecaries and Druggists' shops should be kept open in the different cities of the Province,' this meeting regards the provisons of said act as unjust, vexatious, and highly injurious to the interests of those connected with the said profession, and unnecessary for the public at large; that a petition be presented to the Parliament, praying that the act now before the house, entitled 'Apothecaries' bill do not pass; and that a copy of this resolution be forwarded to the members for the city of Montreal."

Poisonous Hair Dyes.—A correspondent in Woodville, Miss., who had read Prof. Aikin's article in our last number, is desirous that the particular kind of hair dye used should be specified, as he believes "a narcotic of such violence as that described," would be attended with danger in its application to the head.

PAREGORIC.—A correspondent calls attention to the impropriety of many druggists and apothecaries continuing the old practice of using liquorice and other coloring substances in this preparation. The constant association of paregoric and laudanum in the medicine closets, renders it very desirable that they should differ greatly in appearance, to avoid their unintentional substitution, in the often hasty resort that is had to them at night in cases of sickness, or by persons unable to read.

HOPKINS' CHALYBEATE WATER.—We have received a circular in regard to this new mineral water, which informs that the Spring is located about thirteen miles N. E. of Baltimore. Several Baltimore physicians speak of its efficacy as a chalybeate. The following is Prof. Campbell Morfit's analysis:

Chemical Examination of Well Water, from the farm of William Hopkins, Esq., at the head of Saltpetre Creek, Baltimore County, Maryland. Specific Gravity, 1.0003.

COMPOSITION.	PER PINT.	PER GALLON.
Water,	7,290.8092	58,326.4736
Carbonic Acid, partly free,	.3259	2.6072
Carbonate of Protoxide of Iron,	.6360	5.0880
Carbonate of Lime,	.0625	.5000
Carbonate of Magnesia,	.0470	.3760
Chloride of Calcium,	.0707	.5656
Chloride of Magnesium,	.0487	.3896
Chloride of Potassium,	traces	traces.
Organic Matter,	undetermined	undetermined.

A portion of the Carbonic Acid is in a gaseous, absolutely free state, and the Water is therefore a mildly acidulous *Carbonated Chalybeate.*

CAMPBELL MORFIT.

University of Maryland, Baltimore, July 11*th*, 1855.

PHILADELPHIA COLLEGE OF PHARMACY.—The lectures in the School of this College, open by a general introductory by Prof. Procter, on Monday, Oct. 1, at 7½ o'clock, P. M.

DR. WELLS, THE DISCOVERER OF ANÆSTHESIA.—We have received a pamphlet with the above title, containing the *fac simile* of a letter from the widow of Dr. Wells, claiming for her late husband the honor of the discovery of anæsthesia, in opposition to the claims of Dr. Morton, &c. It is greatly to be regretted that this valuable discovery should be the subject of so much wrangling and ill feeling. Where an idea is gradually developed through the action of several minds, and important results afterwards flow from it, it is natural that each participant in the labor should institute a claim. This affair reminds us of the composition of water controversy in which the claims of Cavendish, Watt and Lavoisier were brought in conflict.

The manufacture of Vinegar; its theory and practice, with especial reference to the quick process. By CHARLES M. WETHERILL, Ph. D., M. D., &c. Philadelphia, Lindsay & Blakiston, 1850, pp. 300, 12mo.

Dr. Wetherill has done a good thing in getting out this little volume. The intrinsic value of acetic acid in its crude form, to the welfare of a nation, is a question that rarely has presented itself bodily to the public mind. The time has long gone by when our farmers, from the excess of their cider, could supply this demand, and long ago chemistry directed its powers to develop from the wondrous processes of the laboratory means to form this useful substance quickly, and succeeded perfectly. The volume of Dr. Wetherill is based on that of Prof. Otto's "*Lehrbuch der essig Fabrikation,*" (1857,) and modified to suit the demands of American manufacturers and circumstances. Dr. Wetherill claims for himself "a practical experience of the manufacture of vinegar," and to have added much to the book that gives it a claim to the attention of the student and the manufacturer. We should be glad to give an extract from the work as a sample of its style, but our space is too limited to permit it in this number; we will therefore refer our readers to the book itself, and suggest that many of our farmers who have material fit for yielding vinegar would do well to avail themselves of the information it presents.

Electro-Physiology and Electro-Therapeutics; showing the best methods for the medical uses of electricity. By ALFRED C. GARRATT, M. D., Fellow of the Massachusetts Medical Society. Boston, Ticknor & Fields, 1860, pp. 708, octavo.

Soon after the appearance of our last number, the handsome volume, of which the above is the title page, was received, and we had hoped to have presented our readers with a notice of it, but it has been found impossible to do it. We therefore present a short bird's eye view of its contents as a notice to attract attention to the work, and leave for our next number a closer view of the subject as unfolded by the author. Dr. Garratt has dedicated this book to John Homans, M. D., President of the Massachusetts Medical Society. In the preface it is especially addressed to medical students. The work is divided into ten chapters; 1st, *Natural Electricity;* 2d, *Early history of the medical uses of electricity;* 3d, Electrical instruments and apparatus for medical purposes; 4th, *Electro-physiology;* 5th, *Methods* for the medical employment of electricity; 6th, *Hyperæsthesia*—exalted nerve actions and pains; 7th, *Anæsthesia*—diminished nerve action and paralysis; 8th, *Spastic diseases—spasms, &c.;* 9th, *Midwifery, abdominal viscera, secretions;* 10th, *Electricity in surgery.* The chapters are illustrated by nearly a hundred wood engravings of apparatus and anatomical parts concerned in the treatment by electricity. The book is elegantly printed on good paper. The novelty of the subject to many practitioners, and its real interest as a new and powerful adjunct to the curative means derived from medicines, and above all the long and close study which has been accorded to it by the author, strongly recommend the work to the attention of students and practitioners of medicine.

Catalogue of the Phœnogamous and Filicoid Plants of New Castle County, Delaware; arranged according to the natural system as recently revised by Prof. A. Gray and others, with the synonyms of modern authors. By EDWARD TATNALL. Published by the Wilmington Institute. Sold by J. T. Heald, Wilmington, Del. 1860, pp. 108, octavo.

This is an important contribution to the local botanical literature of our country. Although embracing but 512 square miles, that county contains over 1100 recognized species and marked varieties, nearly one half as many as are included in the entire flora of the Northern States. Dr. Darlington has expressed his belief that New Castle County possesses a richer flora than any other county in the Union. Its proximity to Philadelphia renders this good news to our young botanists, who have cause to thank Mr. Tatnall for his able contribution.

The Anatomy and Physiology of the Placenta,—the connection of the nervous centres of animal and organic life. By JOHN O'RIELLY, M. D., Licentiate of the Royal College of Surgeons, Ireland; Fellow of the New York Academy of Medicine, &c., &c. New York, Hall, Clayton & Co., 1860, pp. 111, octavo.

The reception of this book from the author is acknowledged.

The Columbus Review of Medicine and Surgery. M. S. McMillen, M. D., Editor. Vol. 1, No. 1, August, 1860, Columbus, Ohio, pp 108.

We acknowledge the receipt of this new Medical Journal, and have placed it on our exchange list.

American Medical Times, being a weekly series of the New York Journal of Medicine. New York, July 7th, etc. Bailliere Brothers, pp. 18, Royal octavo.

In this new form, the New York Journal of Medicine presents a business-like aspect, and looks more like an English weekly than any American journal that we remember. The offer of exchange is accepted.

Georgia Medical aud Surgical Encyclopedia, a monthly Journal, edited by Horatio N. Hollifield, M. D., and Tom. W. Newsome, M. D., Sandersville, Georgia. Vol. 1, Nos. 1 and 2. The offer of exchange is accepted.

The Ironmonger, and Metal Trades' Advertiser; a Monthly Trade Circular. London, May 31, 1860, and July, 1860.

This Journal is issued by the proprietors of the "Chemist and Druggist," and got up in the same style. Each number contains 32 pages of short extracts, letters, receipts, etc., having some relationship with the subject in its title, whilst from 60 to 72 pp. are devoted to advertisements, of which a great variety are found. The extract will exhibit one of its features:—

Several veins of nickel, nine inches in depth, are said to have been discovered in Chili. This is the first discovery of this metal in that country so rich in most of the valuable minerals.

By incorporating into melted steel from 2 to 5 per cent. of tungsten, a superior alloy for cutting-tools is obtained. It is dense, hard, and strong, and the tools keep their edge much longer than those made of common steel.

A body falling only one foot strikes with a force eight times its own weight.

The shortest method of calculating the horse-power of engines is to use the unit of 550 lbs. moved one foot per second, instead of 33,000 lbs. one foot per minute.

Fifty years ago a steam engine of 40-horse power cost £4,000.

It is estimated that the annual loss by wear of the gold coinage of the world amounts to £480,000.

OBITUARY.—GERMER BAILLIÈRE, proprietor of the *Répertoire de Pharmacie*, and noted as a scientific publisher, died at Paris on the 18th of December last. He was born in 1806, at Beauvais, France, and enjoyed a wide reputation for liberality and erudition, in the conduct of his business as a publisher and editor of scientific and medical works.

—— EDMOND ROBIQUET, son of the celebrated Robiquet, and himself one of the most promising pharmaceutical savants of Paris, died on the 29th of April last, after three days' illness, owing to perforation of the intestine. M. Robiquet had only recently received the appointment of Professor of Physics in the Ecole de Pharmacie. He is well known for his researches on aloes, on picric and crysolcptic acids, and on the gallic fermentation, and gave much of his time to improvements in photography, on which art he has left a *Manual.*

—— GEORGE W. SMITH, for a long period the Secretary of the Pharmaceutical Society of Great Britain, who, since 1856, has been in bad health, died in April last at Brighton. For fifteen years, and during its early and later difficulties, Mr. Smith was an earnest laborer in the service of that Society, and greatly respected by its members.

THE
AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1860.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

MINUTES OF THE NINTH ANNUAL MEETING.

The ninth annual meeting of the American Pharmaceutical Association assembled at the University Buildings, in the city of New York, on Tuesday, September 11th, 1860, at 3 o'clock P. M.

The President, Samuel M. Colcord, of Boston, and the Secretary, Charles Bullock, of Philadelphia, being present, the meeting was called to order.

The President having appointed W. J. M. Gordon, of Cincinnati, John M. Maisch, of Philadelphia, and Isaac Coddington, of New York, as a Committee on Credentials, a recess was had during their action, and whilst the members present enrolled their names; after which the Committee reported the following delegates appointed by various pharmaceutical bodies:—

From the Massachusetts College of Pharmacy.

Thomas Restieaux, Boston, Charles T. Carney, Boston,
Thomas Hollis, " John Buck, Chelsea, Mass.,
E. M. Blatchford, Rockport, Mass.

From the New York College of Pharmacy.

H. T. Kiersted, William Hegeman,
George D. Coggeshall, John Milhau,
Thomas T. Green.

From the Philadelphia College of Pharmacy.

John M. Maisch, Charles Shivers,
William R. Warner, James T. Shinn,
George J. Scattergood.

From the Maryland College of Pharmacy.

John Block,
J. Faris Moore,
Joseph Roberts,
James Balmer,
Louis Dohme.

From the Cincinnati College of Pharmacy.

William J. M. Gordon,
C. Augustus Smith,
Charles A. Junghanns,
Edward S. Wayne,
J. C. Parr.

The Executive Committee reported the names of the following persons as having been elected members of the Association since its last annual meeting:—

Thomas Kinghorn, Brooklyn, N. Y.
Albert J. Congden, East Greenwich, R. I.
George J. Scattergood, Philadelphia, Pa.
William Evans, Jr., "
Joseph L. Moffatt, Roxbury, Mass.
W. Pryor Creecy, Vicksburgh, Miss.
Francis L. Gaither, Washington, D. C.
J. B. Moore, Danville, Pa.

A list of names for membership was reported by the Executive Committee, without the usual vouchers accompanying them. After some discussion, the list was withdrawn for further consideration.

The Executive Committee then reported the following names as recommended for membership:—

John Butterworth, Boston, Mass.
John L. Hunnewell, "
Francis Tinker, Leominster, Mass.
George B. Fish, Augusta, Ga.
Rob't C. Wardell, Battlecreek, Mich.
John R. Drake, Milwaukee, Wis.
Joshua G. Wilbur, Boston, Mass.
Benjamin J. Crew, Philadelphia, Pa.
Elijah Smalley, Boston, Mass.
J. Lewis Crew, Philadelphia, Pa.
William Saunders, London, C. W.
John Benzinger, Baltimore, Md.
F. A. Weber, Rockport, Mass.
Thomas Sisson, Hartford, Con.
Levi Tower, Jr., Boston, Mass.
Charles E. Savelle, Roxbury, Mass.
Sargeant P. Coe, Portland, Maine.
Edward H. Fernald, Boston, Mass.
Charles T. Rogers, Menton, Mass.

A ballot was ordered. The President appointed Joseph

Laidley and Isaac Coddington tellers, who reported that all the persons above-mentioned had been elected to membership.

The roll of members was then called and the following marked present, viz:—

Henry F. Fish, Waterbury, Con.
William Procter, Jr., Philadelphia.
T. S. Wiegand, “
P. Wendover Bedford, New York.
James T. Shinn, Philadelphia.
W. J. M. Gordon, Cincinnati.
Thomas Restieaux, Boston.
Charles A. Tufts, Dover, N. H.
Joseph Laidley, Richmond, Va.
Thomas A. Lancaster, Philadelphia.
James Stratton, Bordentown, N. J.
Geo. W. Weyman, Pittsburgh, Pa.
Harmar D. Scully, “
Jos. L. Lemberger, Lebanon, Pa.
T. R. Spence, Detroit, Mich.
James Balmer, Baltimore, Md.
Lewis T. Sillyman, Columbia, S. C.
Henry Warren, Boston, Mass.
Edmund Dana, Jr., Portland, Me.
James T. King, Middletown, N. Y.
H. M. Whitney, Lawrence, Mass.
John Thomson, Sumter, S. C.
John Block, Baltimore, Md.
John Buck, Chelsea, Mass.
John Canavan, New York.
William Neergaard, New York.
Jos. H. Thatcher, Portsmouth, N. H.
Henry T. Kiersted, New York.
Thomas T. Green, New York.
John Faber, New York.
W. A. Galatly, New York.
E. R. Squibb, Brooklyn, N. Y.
N. S. Harlow, Bangor, Me.
R. J. Taylor, Newport, R. I.
Henry A. Tilden, N. Lebanon, N. Y.
Ferd. F. Mayer, New York.
Granville M. Clark, Boston.
James Gordon, Boston.
John W. Shedden, New York.
O. G. Dort, Keene, N. H.
Samuel M. Colcord, Boston.
Ashel Boyden, Boston.
George C. Close, Brooklyn, N. Y.
Wm. Evans, Jr., Philadelphia.
George J. Scattergood, “
Henry Haviland, New York.
G. W. Berrian, Jr., N. Andover, Mass.
Charles T. Carney, Boston.
William M. Giles, New York.
John H. Currie, “
John M. Maisch, Philadelphia.
Isaac Coddington, New York.
Frederick Hale, New York.
John Meakim, New York.
Wm. B. Little, M.D., San Francisco.
Benj. J. Crew, Philadelphia.
Charles Bullock, “
Chas. A. Junghanns, Cincinnati.
John Milhau, New York.
Eugene Dupuy, “
T. W. Metcalfe, Williamsburg, N. Y.
Levi Tower, Jr., Boston.
William R. Warner, Philadelphia.
Adam H. Wilson, “
Robert G. Davies, Brooklyn, N. Y.
Wilson H. Pile, M.D., Philadelphia.
M. S. McConville, Worcester, Mass.

The President now called for the reports of Standing and Special Committees. The reports of the Executive Committee, of the Committee on the Progress of Pharmacy, and of the Committee on Home Adulterations were read by title and laid on the table. The report on the Act of Incorporation was not presented,—the Chairman being absent.

The appointment of the committee to nominate officers being in order, the several delegations present, in accordance with the constitution, named the following members :—

Thomas Restieaux, from the Massachusetts delegation.
Thomas T. Green, " New York "
John M. Maisch, " Philadelphia "
John Block, " Maryland "
W. J. M. Gordon " Cincinnati "

The following named gentlemen were chosen from the Association at large, by the President, and added to the committee :—William Procter, Jr., Philadelphia, Dr. E. R. Squibb, of Brooklyn, and Charles A. Tufts, of Dover, N. H.

The reading of reports of the Standing Committees being in order, the report of the Executive Committee was read by Charles T. Carney, Chairman :—

[The Committee congratulate the Association upon the prosperity which has attended its interests the past year, and give a statement in regard to the publication and issue of the Proceedings,—accounting for delay, and offering suggestions for future guidance, among which is the following resolution, which was adopted :—

"*Resolved*, That the Executive Committee receive from the hands of the Secretary, on the last day of the session, all papers and manuscripts with the minutes of the meeting, referred to them for publication; said manuscripts to be fairly and legibly written, and in proper state to be given to the printer; all manuscripts and papers not so delivered, to be excluded from the printed report, unless delay be granted by vote of the Association."

The cost of publishing the last volume of Proceedings was $913.79. The certificate of membership has been issued to thirty-nine members during the past year. Seven members have deceased,—Samuel R. Philbrick and John T. Brown, of Boston ; F. A. Hegeman and James T. Maxwell, of New York City ; Albert G. Palmer, of Washington, D. C. ; Asbury Kent and A. M. Stevens, of Cincinnati, Ohio.]

On motion, the report as read was accepted and adopted. Mr. Fish, of Waterbury, Connecticut, requested that the motion of adoption be re-considered, to allow him to remark on a resolution embodied in the Report. The motion of re-consideration being acceded to, and the resolution having been discussed by Messrs. Fish, Procter, Squibb and Carney, it was finally adopted as it stood in the Report.

The Chairman of the Committee on the Progress of Pharmacy not being present, the Report was deferred until to-morrow.

The Report of the Committee on Home Adulterations was read by the Chairman, Charles T. Carney, and was, on motion, unanimously adopted, and referred to the Executive Committee for publication.

[This Report extends to thirty-six manuscript pages, and is chiefly occupied in the discussion of adulterations of substances directly or indirectly to be considered articles of food,—deeming such within their province as a committee on "Home Adulterations." They begin with drinking-water in its relation with the use of lead pipe as a cause of danger to the public health; and instance cases where disease has resulted. We cannot agree that the force of the arguments adduced are of universal application. Much depends on the character of the water used, and isolated circumstances favorable to the oxidation of the pipes. In Philadelphia, the universal employment of lead pipes is sufficient evidence that so far as relates to Schuylkill water the objection does not hold.

Milk is next considered, and a series of analyses given to show the large proportion of water employed to adulterate this important item of food.

Yeast substitutes next come in for a notice, especially that now sold as a substitute for cream-of-tartar, owing its acidity to super-phosphate of lime.

Wines, brandies and liquors are next considered. The fable of "strychnine in whisky" is exploded; but the Committee find great cause to believe that extensive practice of adulteration and substitution in this class of articles of consumption exists.

Among the drug adulterations noticed in the Report we observe that of opium by leaden shot, nitrate of silver by nitrate of potassa, and chloroform by alcohol. The Report concludes with some general remarks on the importance of the reforms needed, and the necessity of the Association keeping the subject under its active supervision.]

In the absence of the Chairman of the Committee on the Act of Incorporation, no Report was received. (See page 488.)

Mr. Meakim, of New York, offered the following resolution:—

Resolved, That a Business Committee of three be appointed to take charge of any recommendations or unfinished business, and the offering of suitable resolutions for the action of the Association.

The resolution was adopted, and the Chair appointed Messrs. Squibb, Procter and Carney, to constitute the Committee.

The President now read his annual address, as follows :—

President's Annual Report to the American Pharmaceutical Association.

Associates,—On retiring from this honorable position, it is my privilege to thank you for the kindness with which you have sustained me as your presiding officer.

I have tried to fulfil the promise made to you on assuming its responsibilities that you should have my best efforts ; and the consideration and support I have received from each officer and member, is to me an assurance that my successors will find in this Association every attention and support in an honest and impartial administration of its affairs.

It gives me pleasure to congratulate you upon the very prosperous condition in which we commence the ninth year of our labors. Our rapidly increasing numbers, and the amount, variety and quality of talent now at our disposal and continually augmenting, gives promise of a bright and hopeful future ; of a development commenced that shall place pharmacy with the foremost in the sanitary reforms of the day ; performing an active part in removing that stigma from medicine produced by systematic overdosing,—of which Homœpathy and the prevailing medical infidelity is a counterpoise, and which, like the services of counter-irritants, having performed their uses, should be abandoned.

Your order, passed at our last meeting, directing me to forward your petition to the Secretary of the Treasury of the United States, for the removal of restrictions in publishing the importation of drugs, was promptly followed. In reply I received the following answer :—

Treasury Department,
October 17, 1859.

Sir,—In reply to your communication of the 1st instant, I have to say, that the Collector of Customs at New York has this day been authorized to continue the publication of a schedule of the importation of drugs and chemicals into New York—the names of importers to be omitted.

I am very respectfully, Howell Cobb,
Secretary of the Treasury.

To Samuel M. Colcord, Esq.,
President American Pharmaceutical Association.

The Treasurer, will lay before you his report of the financial condition of the Association. For the past two years the receipts have not been sufficient to publish the Proceedings, and the printers have been obliged to wait until collections were made on the dues of the succeeding year, or the Treasurer has been obliged to borrow money to pay the bills. Owing principally to the economical management of the Executive Committee for the past year, the Treasurer is enabled to report the Association not now in debt.

The policy of increasing the amount of our annual contributions for the purpose of extending our publications, and awarding prizes for papers of merit, is a subject worthy your attention at this time. Should you decide to retain the present amount of two dollars as our annual contribution, and publish only for our own members, and public libraries, the benefits to our profession, being confined more within ourselves, might operate as an inducement to membership; but, a more enlarged view would be to increase the amount and value of our publications by offering liberal prizes for meritorious articles, and a wider distribution of them.

Should the value of the Proceedings increase as it has done for two years past, the sale of the work ought to meet any deficiency in its publication. Of its sale the past year, the Executive Committee's report will give you the necessary information.

It is to be regretted that so many errors should have occurred in its publication—owing, chiefly, to imperfect manuscript: in one instance to derangement of type before printing. Doubtless some errors occur in our list of members, although very carefully revised. Omissions have heretofore been liable to occur in consequence of the roll being made up from the records and memorandums of the Secretary, Executive Committee and Treasurer.

Some course should be adopted by which only finished papers should be presented and go directly to the Publishing Committee at the close of the meeting.

If the movers of all resolutions, orders, motions and amendments would put them in writing, it would be a great assistance to the Secretary, and enable him to have an accurate record, *approved* for the Publishing Committee at the close of the meeting.

I can see no reason why our "Proceedings" should not be published within thirty days after adjournment.

The Executive Committee will lay before you a report of their labors. The amount of time and care required by the Chairman of this Committee would seem to require the employment of some suitable person as an assistant in editing the "Proceedings;" but, as yet, no such expense has been incurred, and the amount of labor gratuitously performed by the Chairman of this Committee is deserving the warmest thanks of this Association; and any suggestions made by this Committee are deserving of great weight in your deliberations, as the actual working of the Association, during the recess, is mainly confined to them.

Next year will complete the first decade of our existence as an institution. I would recommend the appointment of some person to make a *general index* of all our previous publications, to be published with our next volume.

Committee on the Progress of Pharmacy.—It has occurred to me that the labors of this Committee cover so wide a field, that to divide its duties would give greater value to the result of its labors. I would not advise to alter the construction of the Committee; but merely assign a separate portion to each member of the Committee, with the addition of others, if deemed necessary. Each to bring in a separate report,—the object sought being to get fuller and more concise reports upon each subject; collecting special information by personal effort, which would not be attempted, if to be collated by one individual of a committee.

Act of Incorporation.—The committee appointed to procure a charter. have paid attention to the subject. I am not aware of the nature of their report to you; but, from the information I have, I should infer that no act of incorporation granted to us by the General Government would be acceptable. Congress does not grant charters for such purposes,—leaving such matters for the action of individual States; unless as legislating for the District of Columbia, we would take a local charter subject to the laws of the District, and having our head-quarters in Washington to a degree that would not be acceptable. In fact, the present sphere of our operations does not seem to require a charter; but, from the interest taken in our objects by all dealers in medicines, it seems to be only a question of time as to our future operations. One of our chief aims should be to give a uniform system of instruction throughout the country to those engaged in pharmaceutical pursuits, or as druggists; and, although our present organization is accomplishing much good—perhaps as much as can be expected at present—yet who believes that the scope of our efforts is to be confined to its present limits, when there is so much to accomplish, and so wide a field to cover? In process of time it is probable there will be made—if the time has not already arrived to make—some provision for our professional education, on a more diffusive, practical and uniform scale than at present exists. There are but few cities in the United States at present that can maintain a school of pharmacy, for various reasons,—one of the principal being a want of practical professors of pharmacy of sufficient influence to secure the attendance of a remunerative class: and. to some extent, the same exists with other professorships required in the same course of instruction. The want of such instruction is daily becoming more apparent: and the increasing interest manifested in pharmaceutical education seems to indicate a time not far distant when such schools will flourish. Strangers of good professional qualifications and repute would be more likely to succeed in such efforts than those educated in the immediate neighborhood of their classes.

Taking this view of the subject into consideration, a charter with educational powers, conferred from some State, encouraging such efforts, would answer our purpose better than one from the General Government. We could then, in addition to encouraging local schools and colleges of pharmacy, organize a learned faculty on a uniform national basis; conferring on them the power of examining candidates and conferring degrees, granting diplomas and certificates of qualification. The appointment of professors could be made from the professors of any colleges or schools already organized, and as many could be appointed as would be required from time to time. Lectures and courses of instruction prepared by them and approved, could then be at the service of any number of pharmaceutists or assistants who would properly organize to receive them, by paying only the expense of their delivery,—leaving it at their option to choose from any of the professors thus appointed, whose services could be secured at the terms mutually agreed upon. It would then become an object for men of talent to qualify themselves for the office and pursue it as a business, by having a sufficient number of such classes, especially if the professors were connected with laboratories, botanical gardens, &c.

Mr. Henry F. Fish, at our last meeting, proposed to have all our annual meetings held in New York, or New York, Boston, Baltimore, Philadelphia and Washington; having a permanent Secretary and headquarters in Washington, acting in some measure as a scientific association; but, as our settled policy has been to meet in as many different cities as is possible to secure a full attendance, for the benefit, it may be, to our profession in different localities, as well as to increase an extended influence, usefulness and roll of members. The proposition met with little or no favor. Had the proposition been understood to embrace the idea of establishing a central office, for the transaction of the business of the Association; increasing it by the collection and distribution of specimens, papers and general information in pharmaceutical matters; the resolution might have been more carefully considered, or referred to a committee. Should it ever be deemed advisable to establish such a central office and employ a permanent Secretary, I can see no good reason why our annual meetings may not be held in different places as at present,—unless the meeting should prove to be burdensome by reason of any impression existing that it is *necessary* to entertain the Association expensively. Should the practice of former years continue of expensive complimentary banquets, it must operate against securing a united action of pharmaceutists in some places where we should like to meet, and possibly render the meetings objectionable in many places. There is no reason why any place in which our meetings are held should provide more than suitable accommodations for the meetings alone; and on many accounts it would be preferable to reverse the custom, and if any entertainment is given, let it be done by the more numerous strangers to the local society, or simply a social gathering of our own members and invited guests, by those of us who have a taste for such kind of thing. In a quiet way, a social gathering may be productive of much good; acquaintances formed in this way often ripen into lasting friendship; and friendship and good-feeling created in the direct line of our occupation, cannot but operate to secure that concert of action for which we are banded together.

Committee on Home Adulterations.—In view of the importance of this Committee, and the interest manifested by the public outside of our profession in its reports, I deem it advisable to continue the Committee, and make a division of the subject for separate reports. For instance, one division might embrace those articles of use as component parts of our daily food,—treating them as subjects of the Materia Medica, or on sanitary grounds; another division might embrace the preparations of the Pharmacopœia; still another, articles of Materia Medica.

The publication of the analysis of most articles as commonly found in commerce, together with a statement of what they should be, would certainly improve the standard of commercial quality, if only by comparison. To what extent it is advisable to publish the names of adulterating parties, I leave it for the committees to report and the Association to decide. The reports of these committees would be much more valuable if members would report cases and send samples for examination to this Committee, who have solicited and been anxious to receive them.

I cannot too strongly urge upon you the duty as well as *policy* of making no compromise with adulterations and adulterators. If there is any sin that should be exposed and punished, it is that which lurks unseen and works mischief and death upon innocent parties.

PHARMACOPŒIA.—At our last meeting, your Committee on the Pharmacopœia made their final report. The result of our labors was presented to the Pharmacopœia Convention and accepted; and, although as an Association we had no delegation in that body, it is gratifying to know that the apothecaries were well represented, and that a majority of the Committee, appointed or elected by the Convention for the revision of the United States Pharmacopœia, are members of this Association, and those whom we should consider most suitable for the purpose. It should, therefore, be considered and upheld as a fair expression of the views of pharmaceutists throughout the United States, more especially as the committee of revision, I understand, are acting very harmoniously; and we may expect in due time a national work that should carry weight and authority with it sufficient to do away with all private formulæ for officinal preparations. It is to be hoped that the Pharmacopœia will be a work of fixed and available standards; and that all who follow the profession of pharmacy will strictly conform to it, that we may have one uniform standard throughout the country, no matter how great a change it may make in the preparations that have been previously in the market.

It is proposed to publish a large and cheap edition, to give it a wide circulation, and we may resonably expect that this Association, in its individual capacity, will do its utmost to establish it as soon as published, as the only authority for preparations that have an officinal name.

SALE OF POISONS.—Owing to numerous cases of poisoning, exciting great public interest of late, the attention of legislation has been attracted to this subject, and it is surprising to notice how weak and inefficient have been all the laws to remedy the evil. The difficulty of framing a law to protect the community, accommodate the public, and at the same time be equitable to the dealer, is very great; and I have little confidence that any law could be passed to protect the public against designed cases of poisoning. Yet, a judicious law, regulating the sale, might greatly reduce the number of accidents. Several States of the Union have passed laws relating to poisons, but none, that I have seen, are at all calculated to remedy the existing evils. It is to be regretted that our profession is so poorly represented in the law-making and law-executing power; inquests and juries have usually been alike deficient in pharmaceutical knowledge when such cases are under legal investigation. It would be well if we could secure a greater amount of legal influence as a profession, by paying more attention to the subject, as no class of business is so poorly represented in legislative assemblies as ours.

The great difficulty of legislating upon this subject, is the great number of articles, the large amount of sales, variety of their uses, the classes of people to whom they are sold, and the frequency of the sales. To some extent this subject has received the attention of this Association, but it has never been arranged in such shape as to facilitate efficient legislation, or a plan submitted for general adoption, to meet required wants in regulating the sale. I would therefore recommend referring this subject again to a committee, with instructions to report upon the best plan for the safe keeping, labelling, selling, dispensing and registering sales of poisons: also, to set forth specific principles on which to frame a suitable law for regulating the traffic, with a view to accommodate and protect the public, as well as pharmaceutists and druggists.

SUNDAY TRADE.—The custom of pharmaceutists transacting business the same number of hours on the Sabbath as on other days of the week, is at present receiving the attention of our profession in many of the larger cities, and it is generally conceded that six hours on the Sabbath would be sufficient time to supply all the medical wants of the community in ordinary times of health. It is due to a proper observance of the Sabbath that our stores should be closed during the usual church services, it is also proper to notice the fact that we have no more legal right to transact business or labor on Sunday than any other class of citizens. As one of the chief objects of our organization is to deliberate for those places that contain but few apothecaries, where there is consequently but little concert of action, I would recommend the adoption of a suitable resolution as the sense of this Association upon this subject, embodying proper recommendations for general adoption.

Members will find the preface to each volume of Proceedings, by the Executive Committee, to contain information, explanations and suggestions of interest up to the time of its publication, worthy the attentive consideration of each member.

Gentlemen, the subjects to which I have drawn your attention, are those which to me appear most important to present at this time, in compliance with the requirements of our Constitution; but permit me to make a few remarks on our vocation as dealers in drugs and medicines. Our roll of members includes persons engaged in every department of this business. each of us anxious to contribute what he can for the general advancement of the whole: our ultimate object being the most honorable and surest way of securing to ourselves a just pecuniary reward, at the same time we are doing our utmost for the greatest benefit to the public. Our customers, or rather I may say the consumers, as a general thing, are unacquainted with the properties of the articles we are daily dealing out to them, and consequently rely upon us to protect them, and supply wants unlike any others of which they may be capable of judging for themselves; the commerce of our vocation is therefore unlike any other, inasmuch as the producer or vender is the party who knows the value of the article, and not the consumer; but the laws of commerce are the same in all commodities, and are regulated by the supply and demand.

Unquestionably our mission as an Association is to create a demand. On sanitary grounds the public good requires us to create a demand for pharmaceutical qualifications of a high grade of character, as well in morals. care and attention to business, as in practical attainments, in judgment and manipulation: this can best be done by informing the public as to the value of such services, and the danger of sustaining a dishonest and ignorant competition.

As to the medicinal articles in which we deal, it is clearly our duty to *create a demand* for pure medicines of reliable quality, as the only safe articles for our patrons to purchase; we should therefore strive to create a demand for this class of goods in preference to the medium and lower grades of quality. As traders, the temptations are as great in our profession as perhaps any other; the public does not seem to comprehend that commerce furnishes as many grades of quality in drugs as among other articles, and that competition in price is fully equal to competition in quality: that it is easier for the time to meet the former than the latter. Now the law which governs commerce, is to furnish any article for which there is a demand, and in my judgment those who deal in medicine prefer to furnish pure articles at the same profit; there would therefore arise no opposition to improvement in *quality* from *any* class of dealers. unless from adulterators, and those who delight to offer inducements in price at the expense of quality. The evils of such competition have to be met by all honest men under all circumstances.

But aside from our *duties* as guardians of the public health, and to our patrons who confide in us. is it *policy* for any of us to act otherwise in any transaction, than, by a conscientious discharge of duty, to protect our customers even when they do not appreciate it, to yield to no temptation for the sake of present gain, and to acquire a character for integrity as an investment equal to capital?

In many respects our characters as pharmaceutists are, with the public, like those of physicians, in proportion to our integrity, judgment and ability; and a large portion of the community prefer to employ the services of a high-priced to a low-priced physician or pharmaceutist.

I hold it true in all trading at retail, that the confidence of the community is fully equal to the capital invested; but in our business, of the transactions on which we are judged, the unknown is as tenfold to the known, and the penalties and emoluments are in like proportion, either in the breach or observance. The number of business hours required of us, our broken Sabbaths, our enervating summer toils, and nights of broken rest, warn us that no one man by personal application can be responsible for all that is done in a drug store, of even very moderate business; it must therefore be the store, as well as the proprietor, that is to merit and sustain a reputation, and the assistants come in for a far greater share of it than is generally supposed. Now let a young man on entering this business sit down and carefully calculate prospects and chances, lay out his plans for life, where he is to get his amusements, who are to be his friends, how manage for recreations, how perform his duties to society socially, how cultivate tastes for all that is true and beautiful; in short, how reconcile his duties as an apothecary, with his necessities as a man. The way in which these questions are answered, and the path he strikes out to pursue, are what is to fix his destiny. If he looks upon his business as merely mechanical toil, seeking to do the least for the most money, and hourly longing for the next moment he can get to spend in amusement outside the business, dreading a return to it, avoiding and postponing those things which must be done, and ought never to be left undone, cultivating disgust for the daily routine of duty, and despising all non-sympathizers, sad must be his life to himself, and profitless to the community; but should his heart be bent on a life of usefulness, a determination to explore and master the mystery and detail of the business, and acquire confidence to stand before his customers as one that can answer their wants equal to any competitor, and secure a list of personal friends from among them; should he explore the sciences and investigate theories connected with his business, as amusements or pleasures, storing up knowledge for truth's sake, cultivate the acquaintance of those in similar pursuits, and make friends from among the stars of his own profession, and intimate acquaintance with the records of those denied a personal acquaintance; society would seek him for his worth, the mortar would yield him pleasure, the graduate would be to him a cup of happiness, and the outside world would form to him a concentrated variety of the same happiness which other people enjoy. This view to many may seem all poetry; but let any one look around and from the past judge of the future, who of those now in business, or retired, are the successful ones; let him inquire of their past history, and compare it with their present standing in all respects in the community, and he will find that virtue brings its own sure reward; that to plough deep, to sow good seed early, to weed out and prune well, are some of the best means to ensure a good harvest; that to cultivate a taste for our profession for pleasure as well as profit, to make all acquaintances, amusements, recreations and associations, harmonize with our routine of business, to give proper attention in just proportion to our religious and moral wants, our civil and political duties, all things necessary to our mental and physical development, our pecuniary interests, our duties to our patrons and our profession, are the most sure means to retain health, and acquire wealth and happiness; and last, though not least of promoting the objects and deserving the thanks of the American Pharmaceutical Association. SAMUEL M. COLCORD.

On motion of W. A. Gelatly, the Address was accepted, and referred to the Business Committee for its action.

On motion of Mr. Buck, the Association adjourned till Wednesday morning at 9 o'clock.

Second Session.—Wednesday, September 12, 1860.

The Association was called to order by the President at near the time adjourned to.

The minutes of yesterday were read and adopted.

The Executive Committee reported the following named persons as recommended for membership, viz :—

O. F. Cawthon, Mobile, Ala.
C. F. G. Meyer, Fort Wayne, Ind.
Peter D. Leys, Brooklyn, N. Y.
S. S. Hubbard, “
Richard Forester, “
George C. Leys, “
Samuel J. Billings, New York.
Benj. F. Stacey, Charlestown, Mass.
W. E. P. Baylis, Brooklyn, N. Y.
William J. Watson, New York.
William M. Giles, “
John Carle, Jr., “
Isaac M. Sands, “
E. E. Knapp, Norwalk, Con.
Jabez H. Hazard, New York.
S. G. Welling, New Rochelle, N. Y.
William E. Hagen, Troy, N. Y.
Jesse Weaver, New York.
George W. Southwick, New York.
John H. Pope, New Orleans, La.
Richard J. Owens, Brooklyn, N. Y.
E. L. Johnson, New York.
John Lyman, Chelsea, Mass.
Edmund Bigelow, Springfield, Mass.
James E. McDaniel, Baltimore, Md.
J. A. Wolf, Pennsylvania.
John McDonald, Brooklyn, N. Y.
Arthur Leitch, St. Louis, Mis.
C. H. Dalrymple, Norristown, N. J.
C. M. Whildon, Pittsfield, Mass.
William J. Darbey, New York.
Wm. G. Stephens, Yonkers, N. Y.
Jas. E. Cunningham, Pittsburg, Pa.
H. M. Pettit, Pittsburg, Pa.
Theodore Moitz, Pittsburg, Pa.
Theodore Schumann, New York.
Paul Balluff, Brooklyn, N. Y.
Otto Laist, New York.
George G. Porter, New York.
George E. Sheils, “
William Ball, “
Henry Bower, Philadelphia, Pa

A ballot was ordered, and Messrs. Laidley and Coddington, acting as tellers, reported the election of all the persons named in the list.

The following members, not present at the previous sittings, signed the register, viz :—

H. H. Burrington, Providence, R. I.
Edward Parrish, Phila. Pa.
John M. Clark, Milledgeville, Geo.
John G. Cook, Lewiston, Me.
John Jackson, Knoxville, Tenn.
B. F. Stacey, Charlestown, Mass.
Fred. L. John, Phila., Pa.
Charles H. Eggert, "
J. G. Wilbur, Boston, Mass.
A. E. Richards, Plaquemine, La.
C. F. G. Collins, Beloit, Wis.
C. B. Guthrie, Memphis, Tenn.
S. K. Norgrave, Pittsburg, Penn.
C. L. Case, Brandon, Vt.
E. E. Knapp, Norwalk, Ct.
John Carle, Jr., New York City.
Paul Balluff, Brooklyn, N. Y.
W. B. Gardiner, New York City.
W. E. P. Baylis, Brooklyn, N. Y.
John A. Dix, New York City.
William J. Watson, "

The Executive Committee stated that other names for membership had been reported, for some of which they had received no vouchers, and others had been objected to by some of the members of the Association. At the suggestion of Dr. Squibb, the names were held over by the Committee to obtain further information concerning them.

The Committee on Nominations now reported the following names for Officers for the ensuing year, viz:—

For President—HENRY T. KIERSTED, of New York.
1st *Vice President*—WILLIAM J. M. GORDON, of Cincinnati.
2d " " WILLIAM S. THOMPSON, of Baltimore.
3d " " THEODORE METCALF, of Boston.
Recording Secretary—JAMES T. SHINN, of Philadelphia.
Corresponding Secretary—P. WENDOVER BEDFORD, of New York.
Treasurer—ASHEL BOYDEN, of Boston.

Executive Committee—WILLIAM PROCTER, Jr., of Philadelphia; CHARLES A. TUFTS, of Dover, N. H.; JAMES BALMER, of Baltimore; GEORGE W. WEYMAN, of Pittsburg, Pa.; JAMES T. SHINN, of Philadelphia, *ex officio.*

Committee on Progress of Pharmacy—JOHN M. MAISCH, of Philadelphia; EDWARD S. WAYNE, of Cincinnati; CHARLES T. CARNEY, of Boston; JOHN MEAKIM, of New York; P. WENDOVER BEDFORD, of New York, *ex officio.*

Mr. Boyden having expressed his desire to be excused from re-election to the office of Treasurer, on motion of Mr. Stratton his resignation was accepted, and the thanks of the Association were voted for his past services.

The nomination for Treasurer being again referred to the Committee, they reported the name of HENRY HAVILAND, of New York.

A ballot was ordered for the officers as nominated. Messrs. Meakim, Laidley and Coddington, acting as tellers, reported the election successively of the President and Vice Presidents; when on motion of Edward Parrish, the President was requested to deposit a ballot for the remaining officers, whereupon the tellers reported their election.

The President elect not being present, Vice President Gordon then took the chair, and James T. Shinn assumed the Secretaryship.

On motion of John Meakim, of New York, the following resolution was adopted.

Resolved, That invitations to attend the sittings of the Association be tendered to the following gentlemen:

Dr. Edward Delafield, President of the College of Physicians and Surgeons.

Dr. John W. Draper, President of the Medical Faculty of the University of New York.

Dr. John Watson, President of the Academy of Medicine.

The Professors and ex-Professors of the College of Pharmacy of the City of New York.

The Fellows of the Academy of Medicine.

The Members of the Pathological Society.

The Members of the N. Y. County Medical Society.

On motion of Thomas S. Wiegand, it was unanimously

Resolved, That the thanks of this Association be voted to the retiring President and other active officers, for the able manner in which they have discharged their duties during the past year.

The report of the Treasurer being called up, was read, showing a balance of $80.89 in favor of the Association. On motion it was accepted, and referred to an auditing committee of three: Thomas Restieaux, Charles A. Junghanns and Dr. E. R. Squibb, were appointed by the Chair to that duty.

Edward Parrish, Chairman of the Committee on the Progress of Pharmacy, read that portion of the Report relating to Pharmaceutical Education and Literature, to the condition of the drug market, the revision of the Pharmacopœia and the Necrological notices, omitting the condensed records of discoveries of materia medica, pharmacy, organic chemistry, inorganic chemistry, and toxicology; the whole document occupying eighty pages of manuscript.

On motion of S. M. Colcord, of Boston, the report was accepted, and referred to the Executive Committee with discretionary power.

On motion of John M. Maisch, the following resolution was passed:

Resolved, That the American Pharmaceutical Association acknowledge their obligation to Messrs. Schaeffer and Koradi, of Philadelphia, for gratuitously forwarding their exchanges with Germany and Liverpool for several years past.

William Procter, Jr., offered the following:

Resolved, That a committee of five be appointed to propose a list of questions for investigation, the ensuing year, and report at a future sitting.

The resolution was adopted, and the following members appointed as the committee; William Procter, Jr., Thomas S. Wiegand, Dr. E. R. Squibb, Charles A. Tufts and Frederick L. John.

Dr. Squibb requesting to be released, Thomas T. Green was appointed in his place.

On motion of George W. Weyman it was

Resolved, That a committee of five be appointed to examine the chemicals, drugs and other articles offered on exhibition to the Association, and report at a future sitting of this Convention.

Charles T. Carney, George W. Weyman, S. M. Colcord, John Canavan and John Meakim were appointed by the Chair.

In accordance with a resolution adopted last year to commence the reading of scientific papers early in the sessions, the queries committed for investigation last year were called up in regular order.

Query No. 1. Relative to "Indigenous Vesicating Agents," was not replied to.

Query No. 2. Relative to Citric Acid, was answered by Charles T. Carney, to whom it had been referred.

Query No. 3. Relative of Aconitia, received no answer; Prof. Graham to whom it was referred, having retired from Pharmaceutical pursuits.

Query No. 4. On the subject of the Production of Alcohol, was answered at a later hour of this sitting by F. Stearns, who had not arrived at this time.

Query No. 5. On the subject of the Varieties of Garlic being called up, Prof. Procter informed the meeting that Dr. Thomas had engaged in the preparation of a paper in answer to the query, but that it had not come to hand. It was resolved that Dr. Thomas's paper on Garlic, when received, be referred to the Executive Committee for publication in the Proceedings.

Query 6. On Aloin, referred to Edward Parrish, was ready, but not present, and was referred to a future sitting.

Query 7. On Sulphate of Ammonia, was read by Charles Bullock.

Query 8. Relative to Chammomile Flowers, was not answered.

Query 9. On Arnica Flowers, received no reply.

Query 10. On Assafetida Plaster, was read by William Procter, Jr., and referred for publication.

Query 11. On Atropia, from American Belladonna, was read by the same gentleman, and referred.

Query 12. Mr. Carney informed the Association that Mr. Melvin had not replied to this query from his inability to procure the Japanese wax.

Query 13. On the Employment of Paraffin in Pharmacy, was answered by Charles T. Carney.

Query 14. On the Carrageen production of New England, was answered by a paper from Mr. Melzar, which was referred.

Query 15. Relative to Conium Seeds, was answered by Henry F. Fish.

Query 16. On Saffron, and query 17 on Cubebs, and query 18 on Digitalin, were not answered when called for.

Frederick Stearns being now present, was invited to read his paper, No. 4 of the list, on the production of Alcohol; it was accepted and referred for publication.

Edward Parrish suggested that the reading of these papers should be interspersed with discussion, if the subjects offered occasion for remark, and believed that the subject just read would afford a ground upon which many could speak. He stated that a kind of Alcohol made in Philadelphia, under the name of "Sweet Spirit," was not mentioned in the report. It was not generally kept, and in fact, the liquor dealers prefer its not being known, as it is employed almost exclusively for making brandies and other liquors. [A general discussion now ensued, in which Messrs. Carney, Parrish, Squibb, Gordon, Colcord, Stearns and Guthrie, took part, and which possessed considerable interest; but our space is too small, and the reader is referred to the official Proceedings of the Association.—Ed.]

On motion of Dr. Guthrie, the Committee "appointed to propose amendments to the Drug Law" in 1858, at the Washington meeting, and which did not report last year, were continued.

Mr. Procter presented to the Association, on behalf of Messrs. Bailliere Brothers, New York, a number of copies of their new weekly Medical Journal, and their catalogue of scientific works, which were accepted.

When, on motion, adjourned to half-past three o'clock this afternoon.

Afternoon Session.

The meeting was called to order by the 1st Vice President, W. J. M. Gordon.

At the suggestion of the Business Committee, the resolution adopted last year in relation to the constitutional provision as to eligibility to membership, and the creation of a third class of associate members, was called up. The subject was discussed by Edward Parrish and Dr. Squibb, and the following was offered:

Resolved, That a committee of five be appointed to mature the proposition to have a third order of members, for the consideration of the Association, to report at a future sitting.

On a vote being taken, the motion was lost.

John D. Dix, after making some remarks on the 23d query, relative to extract of liquorice, which had been referred to him, indicating his inability to procure the requisite information to answer the query satisfactorily, as well as time to make the research, stated in regard to the subject of the adulteration of saffron presented in query 16, called up this morning, that he had not prepared a written answer, but had brought with him several specimens illustrating the subject. These were, first, the true saffron worth $22 per pound; second true saffron deprived of its soluble matter to a considerable extent; third, marigold flowers mixed with a portion of true saffron; and fourth, marigold alone, flavored with tincture of saffron. The third variety was that largely sold in the market at the rate of six or seven dollars a pound; and the fourth variety also sold at $2 to $5 per pound.

The resolution of Mr. Fish, held over from last year, in relation to holding our annual sessions in New York, Philadelphia, Boston, Baltimore and Washington successively, and to the appointment of a permanent Secretary at Washington, was brought forward by the Business Committee, but on a vote being taken was lost.

The Business Committee then offered the following:

Resolved, That a suitable member be appointed by the Chair to prepare a full copious index of the entire Proceedings of the Association, including the volume of the present session, for publication in the tenth volume.

Resolved, That a full set of the Proceedings be placed at the disposal of such member, to be retained by him after the labor shall have been performed.

The resolutions were adopted, and Thomas S. Wiegand, of Philadelphia, was appointed by the Chair.

The Chairman of the Executive Committee offered the following names as candidates for membership, viz:

Robert Thompson, Bloomington, Illinois.
Warren B. Gardiner, New York City.
George M. Wheeler, Detroit, Mich.
Gustavus Ramsperger, New York City.

On a ballot being held, they were all elected.

The Business Committee now called up for consideration the resolution of Alfred B. Taylor of last year, deprecating the offering of entertainments to the Association.

The subject was discussed by Messrs. Maisch, Stratton, Stearns, Wiegand, and others, and on a vote being taken, the resolution was lost.

Franklin K. Phillips and William T. S. Cardy having retired from business, sent in their resignations, which were accepted by the Association.

The following resolution was offered by Frederick Stearns, of Detroit.

Resolved, That as the certificate of membership of this Association is not considered appropriate in point of artistic execution, a committee be appointed by the Chair to invite designs from artists for the purpose, said committee being authorized to draw upon the Treasurer for a sum not exceeding dollars for the expense, and report next year.

After some discussion, on motion of S. M. Colcord, the resolution was laid over until next year.

The reading of scientific papers being in order, Query No. 6, on Aloin, was answered by Edward Parrish.

Query 19. This query, relative to the culture of Elaterium, was not answered by Mr. Tilden, owing to his inability to get the seed in time for the proper season of growth.

Query 20. Relative to Ergotized Maize, was not answered by Prof. Thurber.

Query 21. Relative to a test for Extractum Cannabis, was not answered by Edward Parrish.

Query 22. On Gillenia, offered for general acceptance, was not replied to.

Query 23. As has been previously stated, was not answered for reasons given.

Query 24. On the balsamic nature of Guaiac, was answered by William Procter, Jr.

Query 25. On the changes which spontaneously occur in the officinal Ethereal Oil, was answered in a detailed paper, illustrated with various specimens of the heavy oil of wine, by Dr. Edward R. Squibb, of New York.

Query 26. Relative to the Salts of Morphia, was not answered by Dr. Squibb, owing to unavoidable circumstances, and was continued for next year.

Query 28. On Krameria, was not answered by Prof. Thurber.

Queries 29, 30, 31. Answers were stated to be ready, but the papers were not present, and were postponed till to-morrow.

Query 32. Was not answered by Mr. Cushman.

Query 33. Was not replied to by Dr. Battey.

Dr. E. R. Squibb extended a courteous invitation to the members to visit his laboratory at 149 Furman street, Brooklyn.

Edward Parrish moved that the subject of the next place of meeting be taken up at 11 o'clock to-morrow, which was adopted.

On motion, adjourned to 9½ o'clock to-morrow morning.

Third Day—Morning Session, Sept. 13th.

The Association was called to order by the President, Henry T. Kiersted, who on taking the Chair made the following brief address:

Gentlemen,—In calling the meeting to order this morning, I beg leave to render my sincere acknowledgments for the very unexpected honor which the Association have done me, by electing me to preside over their deliberations.

I say "unexpected," because I was under the impression that some one of my more worthy brethren would have been selected for that station. At the same time, I am free to confess a deep sense of gratification at being thus complimented by this body.

Gentlemen—At a time when sectional strife and jealousy has sown the seed of discord in almost every wide-spread organization; when not only political, but even religious questions have been embittered by mutual distrust and suspicion—it has been eminently gratifying in such times to witness the dignified indifference with which this scientific body has "pursued the even tenor of its way." No clamor of demagogues has found an echo here. No factious whisper has ever disturbed your harmony. With true patriotism and philanthropy you have met year after year, from North and South, from East and West, to discuss, like brothers, questions involving the common good of all. And those of you, who like myself have turned with feelings of melancholy from the spectacle of warring sections, will appreciate the pride with which I respond to your flattering tribute.

May future years confirm the precedent you have so well established; and demonstrate that, where men's hearts are right, there may always be found some common ground on which patriots from every section may stand together without a sacrifice of right or dignity.

Report was made that Charles Shivers, one of the delegates from the Philadelphia College of Pharmacy, was now present.

The minutes of the last session were read, amended and adopted.

The Executive Committee proposed the following names as candidates for membership:

Victor Heydenreich, Brooklyn, New York.
Augustus Presinger, New York city, New York.
George Blinkhorn, Rock Island, Illinois.
Thomas R. Coombe, Philadelphia, Pennsylvania.

A ballot was ordered, and Messrs. Cushman and Coddington acting as tellers reported their election.

Evan T. Ellis to whom was referred query No. 31, relative to commercial varieties of arrow root, read a paper in answer thereto, and exhibited various samples of arrow root. Not having had the opportunity to investigate the subject fully, on motion, it was continued to him for another year.

A letter was read from Prof. R. Ogden Doremus, dean of the faculty of the New York Medical College, dated August 22d, tendering the use of their buildings for the meetings of the Association.

On motion of S. M. Colcord, the communication was accepted, and the thanks of the Association tendered to the New York Medical College for their courteous offer.

The reading of the scientific papers being in order,

Query No. 36. On the products of the distillation of bituminous coal and allied substances. A letter was read from W. H. Whitmore, to whom it was referred, stating that he had printed his paper, and forwarded copies to the Association. As only the introductory portion of the "pamphlet" was written by Mr. Whitmore, (the rest being papers on the subject by other parties, already published,) on motion it was resolved, that only that portion of the report addressed to the Association should be read, and after considerable discussion this was accepted and directed to be placed on file.

The time fixed yesterday for discussing the subject of the next place of meeting having arrived, a motion was made by William J. M. Gordon that the next annual meeting be held in Cincinnati.

A letter from the St. Louis Pharmaceutical Association, signed by its officers, was read, inviting the Association to hold its next meeting in St. Louis.

After considerable expression of sentiment, the motion of Mr. Gordon was amended by the substitution of the words "St Louis" for "Cincinnati," and was finally carried unanimously in the following resolution.

Resolved, That the next annual meeting of the American Pharmaceutical Association, shall be held in the city of St. Louis, at 3 o'clock, on the fourth Wednesday in August, 1861.

Frederick Stearns offered the following.

Resolved, That a committee of nine members be appointed to correspond with the leading pharmaceutists of the western cities, inviting their attendance at the next annual meeting in St. Louis, and if possible to organize excursion parties to start from the Atlantic cities for the same purpose.

Which was adopted.

On motion, it was resolved that when we adjourn, we adjourn to meet this afternoon at half-past three o'clock.

The reading of scientific papers was again resumed.

Query 37. On the essential oil of Sassafras, not having been answered, was continued to A. P. Sharp for another year.

Query 38. On Pink Root and Senega, was continued to L. F. Dohme for another year.

Query 39. On the American species of Cantharis. A letter was read from S. Chapman Hill, to whom this query was referred, giving satisfactory reasons for not having replied to it, and asking for its continuance to him for next year, which was granted.

Queries 40 and 41 received no reply, and were passed by.

Query 43. Dr. Squibb to whom this query was referred, made a verbal reply, based on his experience, but had not been able to produce a figure of apparatus that he felt satisfied to offer to the Association.

Query 44. In regard to the best form of pharmaceutical still for the apothecary, &c., was continued to Dr. Squibb for another year.

Query 29. On Lupuline and Hops, was now read by Charles A. Tufts, and referred for publication.

The Executive Committee now reported the following names as candidates for membership, viz.:

Giles D. Simms, of Washington, D. C.
George Buck, of Chicago, Illinois.
Abram Alberger, Jr., Philadelphia, Pa.
George W. Mowbray, New York city, New York.

A ballot was ordered, and the gentlemen were all declared to be elected.

Query 27. On the depreciation of Smyrna Opium, was answered by P. Wendover Bedford. Interesting comments were made on this subject by Dr. Squibb, Edward Parrish, and others.

Query 42. On Theobroma Cacao, was answered in a lengthy paper by Dr. Donnelly, describing the history, botany, culture and manufactured products of Cacao, a portion of which he read.

On motion, the paper was accepted by the Association, and referred to the Executive Committee.

The following additional members signed the register, either during this or the subsequent sittings, and are all presented together, for convenience:—

Lester S. Hubbard, Brooklyn, N. Y.
C. Shivers, Phila., Pa.
G. W. De la Vergne, N. York City.
Frederick Stearns, Detroit, Mich.
E. Donnelly, Phila., Pa.
Matthew F. Ash, Jackson, Miss.
Charles A. Heinitsh, Lancaster, Pa.
Evan T. Ellis, Phila. Pa.
Wm. M. Somerville, N. York City.
F. V. Heydenreich, Brooklyn, N. Y.
Henry Q. Mack, New York City.
J. Lindley Pyle, Brooklyn, N. Y.
William Ball, New York City.
George M. Mowbray, "
Augustine Presinger, "
Geo. W. Southwick, "
Richard Forester, Brooklyn, N. Y.
Peter D. Leys, " "
George C. Leys, " "
Wm. H. Page, " "
Otto Lais, Jr., New York City.
Th. Schumann, "
Gustavus Ramsperger, "

On motion, adjourned.

Thursday Afternoon Session—Sept. 13*th.*

The meeting was called to order by President Kiersted.

Query 34. On the best method of keeping camphor in the form of powder, was answered by a paper from Henry D. Fish, who presented a sample of the powdered camphor.

The President announced the following gentlemen as constituting the Committee of nine, called for by the resolution of Frederick Stearns, in relation to obtaining a larger attendance at our next annual meeting:—

S. M. Colcord, Boston,
Edward Parrish, Phildelphia,
E. O. Gale, Chicago,
Geo. W. Weyman, Pittsburgh,
John Meakim, New York,
F. Stearns, Detroit,
Wm. J. M. Gordon, Cincinnati,
John Thomson, Sumter, S. C.,
W. H. Peabody, Buffalo, N. Y.

Query 35. On the Guarana of Brazil. Henry F. Fish reported that he had not been able to obtain guarana in time and in sufficient quantity to prepare his essay, and asked to read an essay on "Coca" instead, as an analogous subject. This being approved, he read the paper, which was referred to the Executive Committee.

Volunteer papers were now called up by the Business Committee.

Dr. Wilson H. Pile, of Philadelphia, read a paper on the Dicas Liverpool hydrometer, an instrument for ascertaining the proof of alcohol, and exhibited one of the instruments to the meeting. The paper was referred to the Executive Committee.

John Faber, of New York, read an interesting paper on "Manufacturing Pharmacy," as it might be developed in the apothecary's store. The views given in the essay were advocated by Dr. Squibb and Edward Parrish. Dr. Squibb also remarked on the tendency that selling manufacturers' galenical preparations had to reduce the profession of pharmacy to mere shopkeeping trade. Mr. Stearns also advocated these views.

The Committee appointed to audit the Treasurer's account, reported that they had discharged their duty, and find that the balance of cash to be passed to debit of Treasurer's account, for the current year, amounts to eighty-one dollars and thirty-nine cents.

Edward Parrish presented a living specimen of the Benne plant, from the garden of F. Brown, at Burlington, N. J., illustrative of a paper on the culture of Benne as an agricultural product for its seed and oil. He also exhibited and explained a new gas furnace, peculiarly adapted to evaporation, and, by an additional contrivance, to processes requiring high temperature.

It was moved and carried, that when we adjourn it shall be till to-morrow morning at 9½ o'clock.

The Executive Committee having recommended the name of Wm. H. Page, of Brooklyn, N. Y., as a candidate for membership, a ballot was ordered, and his election was reported by the tellers.

William Procter, Jr., Chairman of the Committee on Subjects for Investigation the ensuing year, reported a list of queries, with the names of gentlemen accepting them, which was read, and the report left open for further additions, when the Committee should report finally. (See page 514.)

On motion, the subject continued last year to Henry A. Tilden, on the comparative value of foreign and indigenous narcotic plants, was, in compliance with the request of that gentleman in a letter to the Association, continued to him another year.

Frederick Stearns offered the following:

Resolved, That this Association will not accept any report or scientific paper, written by a member or contributed by one not a member, which has been previously printed and distributed.

Which was adopted.

The Business Committee reported the possession of a paper received from John L. Kidwell, of Georgetown, D. C., being a "List of medicinal and useful Plants procured by the Agricultural division of the Patent Office."

On motion, the paper was read, accepted and referred to the Executive Committee.

John M. Maisch then read a paper on Narcotic Fluid Extracts, which, on motion, was accepted, and referred to the Executive Committee. The paper was accompanied by specimens of the fluid extracts of Belladonna and Hyoscyamus by the process it recommended.

The same gentleman read a paper on Hydrobromic Acid, which was accepted, and referred as usual.

On motion of Dr. Squibb, the following "Committee on Home Adulterations" was appointed by the chair, viz.: Charles T. Carney, of Boston, Chairman; John D. Dix, of New York; Joseph Laidley, of Richmond; William Procter, Jr., of Philadelphia; Charles A. Junghanns, of Cincinnati, and George W. Andrews, of Baltimore.

After some discussion on the propriety of offering prizes for papers to be read next year, on motion, adjourned to 9½ o'clock to-morrow morning.

Fourth Day—Morning Session—September 14*th.*

The meeting was called to order by President H. T. Kiersted. The minutes of last session were read, corrected and adopted.

The Executive Committee offered the names of the following gentlemen as candidates for membership:—

Alexander Blake, of New York city.
J. Weaver, "

A ballot was ordered; John Meakim and Evan T. Ellis, acting as tellers, reported their election.

Dr. Squibb, of the Business Committee, called for the reading of the biographical paper on Sir Henry Cavendish, which was proceeded with by the author, Henry F. Fish. It spoke of the parentage and education of the distinguished chemist and discoverer, and gave anecdotes of his eccentricities, etc.

On motion, the paper was accepted by the Association and referred to the Executive Committee.

Charles T. Carney, chairman of the Committee appointed to examine the articles on exhibition, read the following report, which was adopted :—

The Committee appointed to report upon the Exhibition of Specimens. submit the following remarks :

Of course, owing to the limited time at their disposal, they can speak only in general terms, except in those cases where special information upon any specimens has been given them by the exhibitors:—

CHEMICALS.

We notice a collection of twenty-four bottles of very fine looking chemicals from Messrs. Chas. Pfizer & Co., of New York; prominent among them are the specimens of Strychnia and its salts, Pyro-Phosphate of Iron, Hypo-Phosphite of Lime, Ammonio-Citrate of Iron, Citrate of Iron and Quinia, Red-Precipitate and re-sublimed Iodine.

A collection of seven bottles of chemicals, made by Messrs. Garnier. Lamoureux & Co., of Paris, exhibited by F. A. Reichard, of New York, are worthy attention for their fine appearance and apparent excellence; among them are Citrate of Iron, Tartrate of Potassa and Iron, Iron by Hydrogen and Soluble Cream-Tartar.

Geo. W. Weyman, of Pittsburg, Pa., has on exhibition several specimens of "Crude Mineral Oils," from the great oil-bearing district of Western Pennsylvania, which are quite interesting,—presenting as they do such a variety of physical characteristics, though taken from localities almost identical.

Specimens of Chloride of Propylamine and Valerianate of Ammonia, in fine crystals, exhibited by Messrs. Benj. J. Crew & Co., of Philadelphia, are, in the opinion of your Committee, the best they have ever seen.

Eight specimens of chemicals are exhibited by Messrs. W. J. M. Gordon & Bro., Cincinnati; among them we notice specially Chromic Acid in crystals, Iodide of Lead, Hydrastin, Naphthalin and Sulphate of Sanguinarina as being very excellent.

Eleven specimens of chemicals exhibited by Edward Parrish, Philadelphia; among them some of the more rare compounds—such as Tannate of Bismuth, Neutral Benzoate of Ammonia, Benzoate of Soda, Terbenzoate of Iron, Nitro-Prusside of Sodium and Aloin are noticed as worthy the attention of members present.

Some very fine specimens of pure inodorous Glycerine, made by Henry C. Bower, Philadelphia, on exhibition by Charles Bullock, of Philadelphia, attract our attention. We find the sp. grav. to be 1·225, and testing it in the imperfect manner at our command, judge it to be a very superior article,—quite equal to any foreign we have seen—and we regard it with gratification, as being an advance in home manufactures.

A specimen of Sulphate of Ammonia, from Gas Liquor, is also exhibited by the same parties.

Henry F. Fish, of Waterbury, Conn., exhibits a fine specimen of "Pulverulent Camphor," prepared by the process peculiar to himself (see volunteer paper in sequel); also a specimen of "Sassy Bark," from the coast of Africa; also specimens of embossed pill-box covers,—the embossing being done by a hand-press.

PHARMACEUTICAL PREPARATIONS.

Edward Parrish, of Philadelphia, Pa., exhibits some forty specimens of various pharmaceutical preparations,—not in general use, but evidently prepared with careful attention; among them Pierlot's Elixir of Valerianate of Ammonia, Glycerole of Hypophosphites, Bitter Wine of Iron; and also Aloin, and Bi-Muriate of Morphia, imported by him from P. Squire, of London, England.

A case of quite a number of pharmaceutical preparations, exhibited by John Faber, Pharmaceutist, of New York, attracts our attention. Many preparations not often made by the retailer, apparently of very reliable quality, show a commendable interest in this branch of our profession. The specimens of fluid extracts, made by formulæ of Prof. Procter, and the powdered vegetable extracts, as recommended by the Prussian Pharmacopœia, attracted our special attention.

We cannot too earnestly urge upon the retail Pharmaceutists throughout the country the real practical and valuable addition to our stock of knowledge which follows the adoption of this plan of personal manufacturing of pharmaceutical preparations.

Charles Shivers, of Philadelphia, has on exhibition some specimens of spread plasters in cases; among them we notice the Isinglass Plaster as being a very fine article. He also has specimens of Water-Proof Arnica and Court Plasters.

A case of neatly spread Strengthening, Warming and other Plasters is exhibited by Geo. J. Scattergood, of Philadelphia.

Specimens of Grape and Blackberry Wine are exhibted by F. A. Rockwell, of Ridgefield, Conn.

An assortment of forty specimens of Dragees and Granules, made by Garnier, Lamoureux & Co., of Paris, France, is exhibited by F. A. Reichard, of NewYork, and presents a handsome and finished appearance.

Alex. Cushman, of New York, exhibits specimens of "Wine of Quinium," and the compound Syrups of the Phosphates and Hypophosphites, and Syrupus Ferri Super-Phosphatis.

C. B. Robbins, of Worcester, Mass., exhibits specimens of Gutta Percha Adhesive Plaster, and "Good Samaritan" Plaster; both articles appear to be of excellent quality.

Messrs. Gale Brothers, of Chicago, exhibit a fine article of Native Wine, made from the wild grape, the flavor of which is very evident.

DRUGGISTS' SUNDRIES AND APPARATUS.

Quite an extensive assortment of druggists' sundries is exhibited by

Messrs. Morgan Brothers, of London, England, through Messrs. Schieffelin Brothers & Co., of New York. We notice several novelties among the collection. The assortment of Liquids for Dyeing is somewhat new. Specimens of Oil Bottles, Pungents, Lint, and Turned Boxes, are also to be found in the collection.

H. H. Burrington, of Providence, R. I., exhibits a specimen of a new Uterine Elevator.

A large assortment of Hydrometers, Urinometers, and Specific Gravity Instruments, exhibited by the maker, Dr. W. H. Pile, of Philadelphia. merits the attention of the Association. They have been found to be every way worthy of confidence after long and careful trials.

Walter P. Denslon, of New York, and Edward Parrish, of Philadelphia, both exhibit specimens of Gas Stoves, which would be found useful in every pharmaceutist's laboratory.

Messrs. B. B. & J. Hagerty, of New York. present several specimens of Glass Ware, Glass Syringes, Breast Glasses, &c. We notice specially the specimen of Glass labelled shop-bottles, with a label, indestructible, as far as the action of alcohol, acids and such liquids is concerned; also a glass-capped Oil-Bottle and Graduated Glass. They have on exhibition a new stand for Soda-Water Tumblers.

CHARLES T. CARNEY,
GEO. W. WEYMAN,
J. CANAVAN,
S. M. COLCORD,
JOHN MEAKIM,
} *Committee.*

Dr. Squibb, from the Business Committee, offered the following preamble and resolution:—

WHEREAS, The subject of legal restraint for curtailing the sale of poisons is at present much agitated in some States of the Union, and appears to be attracting universal attention: *And Whereas*, this Association has always regarded this important subject as one of the reformations most desirable between pharmaceutists and the public: *And Whereas*, Several bills have been enacted and proposed for the purpose of effecting the desired object, neither of which entirely meets the approval of this body; therefore,

Resolved, That the judgment of this Association be now had upon the subject, and that thereon a committee of three be appointed to mature a plan by which the objects may appear to be best attainable,—that committee to report at the next session of the Association.

Dr. C. B. Guthrie made an eloquent address on the subject of the resolution, alluding to the difficulty of deciding who were responsible physicians, to the odium unjustly resting upon the apothecary, when cases of poisoning occur, and the necessity of deciding who are and who are not the genuine apothecaries.

Isaac Coddington said that the law restricting the sale of small quantities of poison, by rendering the purchase of larger quantities easier, would prove more dangerous by causing persons to buy the larger amount overlooked by the law, and lay aside the unused portion where it might be mistaken for culinary articles.

Dr. Squibb deprecated the enumerating of poisons, in the laws restraining the sale thereof, which are not used for murderous purposes, such as cyanide of potassium, cannabis indica, cantharides, essential oils, &c. He also referred to the absence of laws protecting the public from incapable practitioners of medicine and pharmacy, and of those protecting such as are capable. The framers of the laws in attempting to cover too much ground have failed to cover the chief point of difficulty.

Dr. Percy, of New York, was introduced to the Association by Dr. Squibb, and was, on motion, invited to address the convention. He spoke of having aided in drawing up the original bill submitted to the New York Legislature, which was quite different from that now the law, only two sections of the former having been passed, yet he considered so far as requiring a registration of sales it would prove useful. The original bill required that every person who sold poisons should be licensed to do so,—the fee to be fixed upon at a nominal price. This would make every authorized seller of poisons known to the officers of the law, and thus facilitate the detection of the guilty. The object of the law was not for preventing suicide, but to detect the murderer and abortionist; and, in so far as it did this, it would prove useful.

Edward Parrish expressed himself as favorable to such regulating laws, but too many substances have been restricted. He referred to the decision of the Pharmaceutical Society, that the only safeguard was in the character of pharmaceutists and those selling poisonous substances. Apothecaries, in his opinion, saved thousands of lives by their vigilance, and were often blamed undeservedly.

Dr. Guthrie remarked, that if you start with protection to the apothecary, you make it an incentive to young men to properly qualify themselves and take a regular collegiate course, and not be levelled with grocers and dry goods dealers, as mere traders; and that such protective laws are the kind wanted.

Dr. Gardiner, of New York, being introduced, thought it injurious to have laws which cannot be carried out; the New York law he considered to be in that category; that conscientious men in the business were the best safeguard. Any man may set up for a doctor and obtain articles for criminal purposes, and the present registry law can be easily evaded and is futile. He also recommended the idea that physicians should be careful to send their prescriptions to qualified apothecaries.

Charles A. Junghanns, of Cincinnati, was in favor of the Association making the best draft of a law for the purpose that can be effected as a primary step.

W. J. M. Gordon stated that the Ohio law required arsenic to be colored before being sold.

Dr. Bachelder, of New York, thought that the present New York law was somewhat beneficial, but was easily evaded.

John Meakim believed the difficulty laid at our own doors; we were too unwilling to act vigorously in the matter.

Charles T. Carney believed the law should restrict the sale of very few poisons, and that *some* State law would be acceptable to most pharmaceutists. He had entirely declined the sale of some leading poisons in his own store.

Frederick Stearns considered that no law could be framed of any practical results, and that in such laws, if passed, poisons should not be specified, but generalized.

W. J. M. Gordon was opposed to the views of F. Stearns in regard to generalizing the expression of the law, which he believed should specify the most usual poisons.

W. Procter, Jr., remarked that the laws usually passed to regulate the sale of poisons were more for the protection of the public than for the relief of the apothecary; that the Pennsylvania law does not limit the sale of poisons, but compels the registration of five kinds, viz: arsenic, strychnine, morphia, corrosive sublimate and prussic acid when sold by retail; that this law could and should be carried out by regular apothecaries, and would thus far prove useful in tracing purchases with evil design.

Dr. Percy agreed with Prof. Procter, that the use of the law was chiefly in affording the means to discover who had bought and sold poisons, and thus aid the cause of justice.

The question on the preamble and resolution of Dr. Squibb being called for, a vote was taken, and they were adopted.

Edward Parrish offered the following:

Resolved, That the Executive Committee be directed to forward copies of the Proceedings, including those of previous years as far as practicable, to the various pharmaceutical and chemical societies and colleges in this country and Europe, with the request for exchanges.

It was moved to amend the resolution by including the editors of the leading newspapers, which on being put to vote was lost.

The resolution was then voted for, and was adopted.

William J. M. Gordon, of Cincinnati, offered the following:

Resolved, That this Association tender their heartfelt thanks to the New York College of Pharmacy, and to the druggists and pharmaceutists of New York, who have contributed to the comfort and entertainment of its members during the present sessions.

Which was unanimously adopted.

Dr. Squibb on behalf of the Business Committee having informed the Association of the remaining business claiming attention, considerable discussion ensued on the propriety of now entering upon the subject of weights and measures; which, on motion, was taken up.

The following preamble and resolution offered by the Business Committee were read, viz;

WHEREAS, It is the judgment of this Association that a change in the officinal tables of weights and measures is desirable and expedient; *And whereas*, it is understood that the final Committee of Revision and Publication of the U. S. Pharmacopœia, have as yet come to no action upon this subject; therefore,

1. *Resolved*, That it is expedient and proper for this Association, at this time, to offer its judgment upon this important subject.

2. *Resolved*, That the change of weights recently adopted in the Committee of the Council for consolidation and revision of the British Pharmacopœia, by which change the table of avoirdupois weight is adopted, with a new division of the avoirdupois ounce into 480 parts, to be called grains, meets the approval of this Association, and is recommended for adoption in the National Pharmacopœia.

The vote being taken on the preamble it was adopted.

The first resolution was also adopted.

The second resolution was read again, and its tendencies explained by Dr. Squibb, and views were expressed by various members on the subject. After a great deal of discussion, in which the majority were opposed to the resolution, the motion to adjourn till 3½ o'clock prevailed.

Afternoon Session.

The meeting was called to order by the President.

The Chairman of the Committee on Questions for Investigation, &c., read the conclusion of the report, which was now on motion adopted in full, and is as follows:

The Committee appointed to prepare a list of subjects for investigation next year, report the following, viz :—

1. Is morphia volatilizable by heat without losing its narcotic properties? If not, how are the narcotic effects of opium smoking accounted for?
Accepted by William Procter, Jr., of Philadelphia.

2. Cerate made with Japanese wax is said to acquire a dark color. Is this change a necessary consequence of the use of that wax? and what is the real value of that substance in Pharmacy?
Accepted by Thomas A. Lancaster, of Philadelphia.

3. To what extent can oil of benne (ol. sesami) be substituted for olive oil in Pharmacy? *Accepted by James T. Shinn, of Philadelphia.*

4. What are the probabilities in favor of tartaric acid and tartar becoming commercial products of the wine culture of the Ohio valley?
Accepted by W. J. M. Gordon, of Cincinnati.

5. Can the root of Aconitum napellus be economically produced in the United States, and does it possess the activity of the imported drug derived from that plant?
Referred to Henry A. Tilden, of New Lebanon, N. Y.

6. Arsenical pigments;—are they as extensively employed, and with such poisonous effects as has been asserted?
Accepted by Benjamin J. Crew, of Philadelphia.

7. Is there a permanent solvent for cantharidin that will retain it in a liquid state in pharmaceutical preparations?
Accepted by Wm. R. Warner, of Philadelphia.

8. Garancin. What is the best process for obtaining it, and the best method of testing its purity as found in commerce?
Accepted by Benjamin J. Crew, of Philadelphia.

9. Is there a principle in Chenopodium anthelminticum analogous to santonin? *Accepted by James Balmer, of Baltimore.*

10. Is there a crystalline active principle in capsicum? or does it owe its activity to a soft resin?
Accepted by Frederick L. John, of Philadelphia.

11. What are the advantages, if any, of Conium seeds for making the Tinctura Conii, as regards uniformity of medicinal strength, and increased power, compared with the leaves?
Accepted by Henry F. Fish, of Waterbury, Conn.

12. Has the resinoid principle of colocynth, extracted by alcohol, a reliable and constant therapeutic power? and may it advantageously be employed in medicine? *Accepted by John Faber, New York City.*

13. The oil wells of Western Pennsylvania—the quantity and quality of oil they afford at present, their prospective value, and the geological character of the formation where the oil is deposited?
Accepted by George W. Weyman, of Pittsburg.

14. Does wood creasote exist in the market? To what extent compared with coal tar creasote or carbolic acid? And what are the objections, if any, to the substitution of the former by the latter substance in medicine?
Accepted by Charles Bullock, of Philadelphia.

15. Cotton seed oil, the expressed oil obtained from the seeds of Gossypium herbaceum, being easily obtained, and at a low rate:—Are there any therapeutic objections to its being substituted for olive oil, in pharmaceutical preparations? *Accepted by William J. Watson, of New York City.*

16. Is propylamin the principle in Ergot that influences uterine contraction; and if so has the propylamin of commerce, derived from herring pickle, a like power? *Accepted by E. Donnelly, M. D., of Philadelphia.*

17. Is there a test for the therapeutic value of extract of Cannabis Indica, based on the chemical behaviour of its resin, that may be relied upon to distinguish the active from the inert drug?
Accepted by William Procter, Jr., of Philada.

18. It has been alleged that commercial honey is sometimes largely adulterated with artificial grape-sugar syrup, and ordinary syrup. Is this true—where, and to what extent, is it carried on, and how may the adulteration be detected? *Accepted by Frederick L. John, of Philad.*

19. What is the most eligible manner of dispensing Phosphorus, for internal use? *Accepted by John Faber, of New York City.*

20. Is the sedative action of Veratrum viride due to the veratria known to exist in it, or is there another principle contained in it to which that power is due? *Accepted by George J. Scattergood, of Philad.*

21. Copaiba. What are the botanical sources of this drug as at present furnished to commerce? and what is its present commercial history?
Referred to Prof. Joseph Carson, of Philadelphia.

22. What is the actual condition of the codliver oil production and trade, in the United States? *Accepted by E. M. Blatchford, Rockport, Mass.*

23. Is the present wholesale production of sugar-coated pills advantageous to the interests of medicine? If not, what are the objections to it? what are the best processes for coating pills with sugar, gelatin, and other substances, for extemporaneous use, by the dispenser of prescriptions?
Accepted by Frederick Stearns, of Detroit, Mich.

24. Does the root of Convolvulus panduratus contain a glucocidic resin analogous to jalapin, and has it cathartic properties?
Accepted by J. L. Lemberger, of Lebanon, Pa.

24. What is the value of Chelidonium majus as a source for sanguinaria, compared with Sanguinaria canadensis?
Accepted by P. Wendover Bedford, of New York City.

26. What is the tannin value of the indigenous astringents of the United States, for medicinal and other purposes?
Accepted by Wm. R. Warner, of Philadelphia.

27. Can Phospho-molybdic acid, as a reagent for alkaloids, be made available as a test for the strength of the narcotic extracts?
Accepted by Ferdinand F. Mayer, of New York City.

28. What are the statistics of the trade in castor oil, as regards locality and amount of production of the beans, and the preparation of the oil?
Accepted by Ferdinand F. Mayer, of New York City.

29. To what proximate principle does the marc of castor oil beans owe its activity as a purgative?
Accepted by William R. Warner.

30. What is the true botanical source of "Southern Prickley ash bark?"
Referred to Dr. Robert P. Thomas, of Philadelphia.

31. The subject of new remedies, with reference to their effect upon the progress of pharmacy, and their educational influences upon pharmaceutists. *Accepted by Edward Parrish, of Philadelphia.*

32. Anilin dyes—the history of the discovery and production of these coloring agents, and their probable influence on the decorative arts.
Accepted by George W. Weyman, of Pittsburg, Pa.

33. An essay on tartaric acid, and the medicinal tartrates, in their chemical and pharmaceutical relations.

Accepted by John M. Maisch, of Philadelphia.

34. Is the tomato available as a source of citric acid for the supply of commerce, and has the seed of this fruit any medicinal power?

Accepted by Thomas A. Lancaster, of Philadelphia.

35. Are the "Spirits" of the Pharmacopœia better when made by distillation, than the preparations made by dissolving the respective volatile oils in alcohol. *Accepted by Thomas Wiegand, of Philadelphia.*

36. What course should be adopted by pharmaceutists in view of the present state of the liquor market, particularly as regards factitious brandies and wines?

Accepted by Henry F. Fish, of Waterbury, Conn.

37. An essay on the commerce in Quackery, in the United States, and its influence on the practice and progress of pharmacy.

Accepted by Thomas S. Wiegand, of Philadelphia.

38. The leaves of the castor oil plant (Ricinus communis,) and their reported property of promoting the secretion of milk.

Accepted by Alexander Cushman, of New York City.

39. What is the botanical source and commercial history of the "anacahuito wood" of Mexico, said to be used in Germany for diseases of the lungs? *Referred to Charles Caspari, of Baltimore, Md.*

40. What are the sources of the senega and spigelia of present commerce? *Continued to L. H. Dohme, of Baltimore, Md.*

41. Can Elaterium be produced in the United States, and if so, is the indigenous product equal in power to the English drug? (for 1861 and 1862.)

Referred to Professor Robert P. Thomas, of Philadelphia, Pa.

42. What is the smallest outfit of apparatus for a retail pharmaceutist with reference to the preparation of those chemical and pharmaceutical products which are economically made on a small scale?

Accepted by Edward Parrish, of Philadelphia.

44. What are the best arrangements, and precautions to be observed in the preparation of soap for pharmaceutical uses.

Accepted by Charles Shivers, of Philadelphia.

45. What is the active principle of arnica flowers; and what the best process for isolating it?

Continued to Dr. Henry T. Cummings, Portland, Maine.

46. The American species of the genus cantharis as regards their usefulness in medicine as vesicants, their existing quantity in view of the supply of commerce, and other information regarding them?

Continued by request to T. Chapman Hill, of Antioch, Ohio.

47. What is the best form and material for a still for the pharmaceutist's use of from two to four gallons capacity, appropriate for heating by gas or stove heat, which shall combine economy with efficiency and fitness?

Continued to Dr. E. R. Squibb, of Brooklyn, New York.

48. An inquiry relative to the comparative value of the several arrow roots of commerce, which are derived from the Maranta arundinacea, &c., the query of last year.

Continued to Evan T. Ellis, of Philadelphia.

49. European Pharmacy,—what are the chief differences and points of resemblance between it, and our own?

Continued to Robert Battey, M. D., of Rome, Georgia.

50. What are the principal sources of oil of sassafras for the supply of commerce, and what is its mode of manufacture and the quantity produced annually?

Continued to Alphæus P. Sharp, Baltimore, Md.

The Committee desire to receive authority to add to this list such of the unanswered questions of 1860, and others, as they may deem most likely to receive attention from the gentlemen to whom they may be intrusted.

WILLIAM PROCTER, JR., *Chairman*,
THOMAS S. WIEGAND,
EDWARD R. SQUIBB,
CHARLES A. TUFTS,
FREDERICK L. JOHN,
New York, Sept. 14, 1860. *Committee.*

After some informal discussion on the subject of offering prizes for scientific papers, on motion it was laid over to come up with the unfinished business next year.

Query No. 30. On "Patents in their relation to Pharmacy and Medicine," by Edward Parrish, was now read, (it having been mislaid when called for in the proper order,) and was referred to the Executive Committee.

The President announced the following gentlemen as the committee of three called for by the resolution in relation to the sale of Poisons:

Samuel M. Colcord, of Boston,
William Procter, Jr., of Philadelphia,
William J. M. Gordon, of Cincinnati.

The subject of weights and measures being now called up, the second resolution was read again, the discussion continued, and on a vote being taken it was not adopted, the general expression being against it.

Dr. Squibb offered the following as a substitute for that resolution, viz:

Resolved, That in the judgment of this Association it is expedient and practicable in the officinal formulas of the Pharmacopœia to abolish the use of measures of capacity, and to substitute for absolute weights and measures the term *parts,* meaning *parts by weight;* and that this Association recommends such a change as the most simple, practicable, and effective one that can be at present made.

After considerable discussion this resolution was adopted. [It is proper to state that the number present when these resolutions were lost and passed was much smaller than the average attendance at the other sittings, and it is to be regretted that a subject of such general interest should have been left till the last sitting for its decision.—Ed.]

The Business Committee brought forward the following:—

"Whereas this Association recognizes the justice and propriety of the recent movements in some localities, in regard to restricting the Sunday business of pharmaceutists to certain definite hours, for very obvious good reasons, therefore

Resolved, That this Association heartily recommends the adoption of definite hours for the transaction of the necessary Sunday business; such hours to be determined by the co-operation of the public, the Medical and the Pharmaceutical interests of the various localities, when these interests may combine to adopt the recommendation.

Which was adopted.

The Business Committee reporting that there was no more business to be brought forward, it was on motion resolved that that committee be continued to bring deferred business before the Association next year.

John M. Maisch offered the following:

Resolved, That the thanks of the Association are due to the President, the first Vice-President and the Secretary, for the efficient performance of their duty.

The minutes were then read and approved, when the Association adjourned to meet in St. Louis on the fourth Wednesday of August, 1861, at three o'clock, P. M.

James T. Shinn, Secretary.

INSECT POWDER.

By Joseph Abel.

A vegetable powder, under the name of Persian Insect Powder, has lately been introduced into the drug market, for the extermination of insects, vegetable parasites, etc. Until recently, the botanical source of this powder has not been known. For a number of years it was erroneously considered to be a native of Persia, but it has been traced beyond question by Dr. Koch, as having its origin in the Caucasian provinces, and to be the contused blossoms and flowers of Pyrethrum Roseum and Pyrethrum Carneum. It is of a yellowish gray color, perfectly odorless, yet slightly irritating the nostrils; at first almost tasteless, but afterwards leaving a burning sensation upon the tongue. The high price obtained for it, taken in connection with the scarcity of the article, has induced dealers to adulterate it with plants of similar characteristics, such as chamomile flowers, fleabane, etc., but the presence of these extraneous substances can without difficulty be detected by the peculiar odor, and from the fact, that in proportion as these substances are introduced, the efficacy of the powder is impaired.

From experiments lately made in Europe, it has been sufficiently demonstrated, that the plant can be propagated from the seed, and that it will thrive well in a climate similar to that of our Northern States.

I have recently been informed by a gentleman who obtained some of the seeds of this plant from the Agricultural Bureau at Washington, that the plants therefrom are in a flourishing and prosperous condition.

As its effects for the destruction of bugs, roaches, parasites on delicate plants, etc., has been fully established, and it being otherwise harmless, its introduction into general use would be of great importance to families and horticulturists, from the fact that it would exclude the use of poisonous articles, now resorted to for such purposes, which are often the cause of serious accidents.

Pittsburgh, August 31, 1860.

CHEMICAL NOTES.

By John M. Maisch.

Chloride of Potassium.—Chemical works state that this salt crystallizes in cubes, sometimes elongated to prisms, and rarely in octohedrons. Several years ago, when evaporating a considerable quantity of a solution of this salt, it occurred to me to ascertain under what circumstances it might be made to assume these different shapes. I exposed the solution to the heat of a sand bath, taking care not to raise the temperature to the boiling point of the liquid. In this condition it separated perfect cubes. As soon as they commenced to grow together, the solution was decanted and allowed to cool slowly at a summer temperature. The chloride now crystallized in four-sided prisms which were drained on a funnel, and the clear liquid set aside over night, when the salt was found to have crystallized in irregular pyramids, composed of numerous small crystals.

Since that time I have repeated the experiment on several occasions, always with the same result. In no instance did I obtain octohedrons, which are stated to be produced from alkaline solutions. I took good care to have my liquid in all cases perfectly neutral, and to cool it very slowly upon a bed of straw or saw dust, and in a room not affected by sudden changes of the atmosphere.

The cubes are semi-transparent, sometimes nearly opaque and perfect when single, but usually deformed on one side when grown together. The prisms are four-sided, rectangular, transparent, and, as seen under a magnifier, do not consist of cubes grown together in the direction of one axis; when exposed to heat, they decrepitate below their fusing point, losing a little hygroscopic water, and break chiefly in the direction of their long axis, resulting in smaller prisms and needles but not in cubes. The pyramids are an irregular section of a cube, and are composed of a conglomeration of the rectangular prisms joined together by their prismatic planes; the end planes are cut off at an angle of about 45°, to which the planes of a layer of prisms, cut off in a similar oblique direction, are joined so as to form a right angle. The space between these two layers is filled up with shorter prismatic crystals, attached to one another in the same manner. Among these shorter crystals I could in no case discover a really cubic crystal.

Occasionally, I have met among the last crop of crystals some which had all the appearance of two or three planes of a hollow, regular octohedron; they are very thin, striated lengthways under the magnifier, as if composed of prisms, and look like a portion of the hollow, four-sided pyramids in which chloride of sodium frequently crystallizes.

It appears to me, in accordance with the foregoing facts, we shall have to consider chloride of potassium as dimorphous in two different systems. Besides crystallizing in regular octohedrons, the solution separates, when kept near its boiling point, regular cubes, and on and after cooling, rectangular prisms.

Paramorphism of the Chlorides of Ammonium and Potassium.—The salts of ammonia are isomorphous with the corresponding salts of potassa. If a solution of chloride of ammonium is evaporated and allowed to crystallize, feathery crystals are obtained. which on closer examination prove to be composed of small cubes. If chloride of ammonium is subjected to sublimation, a fibrous mass is gained, which evidently has a crystalline structure, though perfect crystals cannot be separated from it. There seems to me no reason why these fibres ought not to be considered as prisms. They readily split in the direction of their long axis, but break with difficulty transversely; two parallel prismatic planes may be obtained with little difficulty, but the other two, if four-sided, or the other four planes, if they should be six sided prisms, are usually uneven from adhering fibrous crystals, and cannot be readily recognized. From analogy, however, we have to conclude that they must be four-sided prisms.

The prismatic chloride of potassium has in some respects a similar behaviour. It is not so tough as the ammonium salt, and may be readily reduced to powder; but when it is heated until it decrepitates, the prisms chiefly split lengthwise, just like the fibrous crystals of chloride of ammonium behave under the pestle or the hammer.

These fibrous crystals cannot belong to the regular system, for the feathery crystals which are made up of regular cubes, are easily rubbed into powder, and thereby show a marked difference from the fibres, although the composition of the salt is in both instances alike $=NH_4Cl$. Chloride of potassium $= KCl$, likewise contains no water of crystallization when crystallized in either form.

For the above reasons I consider both chlorides dimorphous, each crystallizing in the regular and the rectangular system, and isomorphous in both forms. But the difference between the two consists in the temperature at which the crystallization takes place; chloride of potassium crystallizes from a concentrated solution on and a ter cooling in prisms, while chloride of ammonium forms under the same circumstances cubes; at a higher temperature, when sublimed, the latter condenses in prisms while chloride of potassium is deposited from a hot, concentrated solution in cubes.

Acetate of Ammonia.—The Pharmacopœia orders the solution of this salt to be prepared by neutralizing diluted acetic acid with carbonate of ammonia. It is not very easy to arrive in this way at a precisely neutral liquid; test paper is of no avail, inasmuch as the solution shows an acid reaction even in the presence of a not inconsiderable amount of carbonate of ammonia, on account of the carbonic acid gas which is retained by the liquid. Constant agitation in a mortar will expel most of it, but if an excess of carbonate of ammonia was present, some bicarbonate will have been formed, which is entirely different in taste from the sesqui- and monocarbonate. To avoid an excess of ammonia, the solution is generally left slightly acid; but a better way would be to heat the diluted acetic acid to about 180°, and neutralize it at that temperature with the powdered carbonate.

A still easier method is to effect the neutralization with caustic ammonia, as is directed by most of the European Pharmacopœias. One measure of acetic acid may be diluted with three measures of water, neutralized with ammonia, and then diluted with water, so as to make altogether eight parts. Thus with a strip of blue litmus and of turmeric paper, the precise point of neutralization may be easily determined.

Separation of Iron from sulphate of Copper.—Sesquioxide of iron is precipitated from its solutions when boiled with acetate of ammonia. Supposing that this behaviour might be made use of in separating, in an easy manner, iron from coppersalts, I made some experiments, but the result was not satisfactory. When acetate of ammonia is added to a solution of sulphate of copper, the color is changed to blue green, the color of the neutral acetate of copper; when heated, the liquid becomes turbid, and separates a considerable quantity of pale green basic acetate of copper, which is not taken up again by cooling, by the free acid of the liquid.

Solution of Iodine in aqueous Ether.—When iodine is dissolved to saturation, in washed ether, which has not been freed from water, the solution separates into two strata, the lower of which contains all the water.

Phosphate of Alumina from Nux Vomica.—A friend handed me a tasteless white powder, which was obtained from nux vomica, as the result of an experiment to prepare strychnia without alcohol. The acid decoction of nux vomica was precipitated by milk of lime, the precipitate treated with sulphuric acid, and the filtrate precipitated by an excess of ammonia. When analyzed, this white powder was found to be composed principally of phosphate of alumina, together with some phosphate of magnesia and lime, and a trace of perphosphate of iron; it contained not a trace of strychnia or brucia. It would be interesting to institute further experiments, whether the alkaloids can not be extracted in the manner described. On account of the presence of the earthy phosphates, the use of alcohol cannot be avoided by this process, but still it is curious enough why the alkaloids were not taken up by the sulphuric acid and precipitated by the ammonia.

Philadelphia, Sept., 1860.

ON THE EXPLOSIVE NATURE OF GLONOIN OR NITROGLYCERIN.

By Charles E. Ferris.

To the Editor of the American Journal of Pharmacy.

Dear Sir,—I have met with an accident (which nearly cost me my eye-sight) in the preparation of "Nitrate of the oxide of

Glycyle." I saw it mentioned repeatedly in the newspapers as a remedy for neuralgia ; and as its mode of preparation was given, I found it in Gmelin's Handbook, page 501, vol. ix., under the name of Nitro-Glycerin, and prepared a small quantity according to the process described in Gmelin, and when I judged the process complete, added a large quantity of water and filtered the milky mixture. The water passed through leaving the oily liquid on the filter, which itself began to pass through, after a time. This was dissolved in alcohol, and precipitated by water, and allowed to stand to evaporate. After separation from the water and drying, it was dissolved in ether, and the solution set aside (after filtering) for the ether to evaporate.

After standing several days, and when there remained a very slight film of ether on the surface, I drew it up into a small pipette, and then closed the end of the jet tube by the blowpipe (of course inclining the tube so that all the liquid run into the bulb). There remained a small bubble of air in the tube below the bulb which I attempted to drive up by heat. While heating it gently over a gas flame for this purpose, it exploded with a deafenning report, driving the glass in dust and fragments into my face and eyes, blowing out all the lights in the room, and throwing down a multitude of bottles from the shelves. The noise was so deafening that I have not yet, after a lapse of three weeks, recovered my hearing perfectly. There was only about ½ dr. of the liquid in the pipette.

The only circumstance mentioned in Gmelin from which one might infer explosive properties, is the fact *mentioned* that it decomposes rapidly when placed in vacuo over oil of vitriol.

The explosion I think was due to an *instantaneous* decomposition.

I communicate to you these facts, to make what use of them you please. If the article is of sufficient importance to lead to general use, it will be important to be on guard against a similar accident in its preparation, and at any rate it is (as far as I am aware) another fact added to our knowledge of the substance under consideration.

Very respectfully,

Charles E. Ferris.

New Castle, (*Del.*) *Sept.* 24, 1860.

ON THE PRODUCTION OF ATROPIA FROM AMERICAN GROWN BELLADONNA ROOT.

By William Procter, Jr.

(From the Proceedings of the Amer. Pharm. Association, 1860.)

At the Meeting of the American Pharmaceutical Association, at Boston, September, 1859, I accepted the following question:

"The Atropa Belladonna is largely grown at New Lebanon, (New York,) for the preparation of the officinal extract. Can the root of the plant as grown there, be advantageously employed as a source of atropia?"

Through the kindness of Mr. Henry A. Tilden, of New Lebanon, several pounds of belladona roots were collected in October last, and carefully dried after being transversely sliced in the manner of columbo root. These roots had a light ashen yellow color, and an odor analogous to that of stramonium roots, which in fact they in several respects resemble. The drug fairly represented the plant as produced in that locality, and was reduced to powder by grinding.

10,000 grains of the powdered roots were moistened with half a pint of alcohol of 85 per cent. packed firmly in a large glass funnel, suitably arranged for percolation, and covered with a disc of filtering paper. Alcohol of the same strength was now poured on from time to time, until ten pints of liquid had very slowly passed. The first six pints of liquor were kept separate from the last runnings. The tinctures were set aside (the weather being cool) until a convenient season. In about a week the stronger liquid commenced to deposit a crystalline substance on the inside of the bottle, which at the end of two weeks apparently ceased to increase in bulk. The liquid was decanted, the crystals detached from the sides of the vessel, washed with alcohol and when dried weighed 112 grains. Examined with a lens, the crystals were found to be a derivative of the oblique rhombic prism, and in fact to resemble cane sugar. They were soluble in water, had a sweetish taste, were colorless and brilliant, were charred by concentrated sulphuric acid, and when boiled with water containing a minute quantity of tartaric acid, easily reduced the oxide of copper, when Trommer's test for grape sugar was applied, thus leaving no doubt of their saccharine nature.

The alcoholic liquids were now mixed together, and one-fourth set aside. To the remainder, 360 grains of lime, previously hydrated and in powder, was added, and the vessel frequently shaken during twelve hours. The tincture from being light colored, became of a brown hue; it was filtered from the precipitate and excess of lime, and diluted sulphuric acid carefully dropped in, with agitation, until the liquid had a slight acid reaction. The precipitate of sulphate of lime and coloring matter, was separated by filtration, the alcohol distilled off by aid of a water bath heat, and the syrupy residue treated with ether to remove the fixed oil and resinous matter that it contained. The liquid separated from the ether was gently heated, to remove traces of that substance, and then half an ounce of carbonate of potassa, mixed with two fluid ounces of water, was added, shaken, allowed to stand for 24 hours, and filtered to separate the precipitate. This was washed with a little cold water, dried, and weighed only three grains. It appeared quite evident that either atropia existed in but small quantity, or that the precipitant used was not a proper one. Thus far, except in the ethereal treatment, the process is that of Mein.

Assuming that the atropia was yet held in solution, the liquid was mixed with three ounces of chloroform, and then solution of potassa added gradually, with frequent agitation, until, on resting, the aqueous supernatant liquid was decidedly alkaline, and of a dark, almost black color. The chloroform was now decanted, and by spontaneous evaporation yielded 24 grains of a fawn-colored crystalline matter, having an alkaline reaction, which in fact was atropia with coloring matter.

Believing that chloroform was the best agent for isolating the atropia, the remaining fourth of the original liquid was evaporated to three fluid ounces, diluted with its bulk of water, and filtered to separate oily and resinous matter. Half a fluid ounce of chloroform, followed by the same bulk of liquor potassæ, was added and well shaken for several minutes, and the chloroform decanted and allowed to evaporate spontaneously. The product was a greenish, amorphous, wax-like matter, possessing an alkaline reaction and weighing 18 grains. This consisted of atropia and. oleo-resinous matter extracted by the chloroform. It was treated with half an ounce of water containing 20 drops of diluted sulphuric acid, which was not sufficient to saturate the atropia, and ten drops more were added, the liquid filtered to separate the insoluble matter, and liquor ammonia dropped in till it ceased to produce a precipitate. The latter was a bulky hydrate of a light color; its exact quantity was not ascertained, but probably amounted to 10 grains.

The ethereal washings of the first liquid on evaporation yielded a fixed oil, of a greenish brown color, which was partially crystalline; and also a small portion of resinous matter. These were set aside.

In reviewing the last experiment, the disadvantage of treating the crude liquid with chloroform before the separation of the oily matter was quite apparent, and taking advantage of the fact that sulphate of atropia is insoluble in chloroform, I determined to modify the process by substituting chloroform for ether, as a means of removing the fixed oil, &c., which greatly facilitates the process, and affords the best and easiest method of obtaining this alkaloid that has been offered, which is as follows:

Take of Belladonna root, in fine powder, 10,000 grains.
Lime‘ 480 grains,
Diluted sulphuric acid,
Chloroform,
Alcohol, each a sufficient quantity.

Moisten the powder with half a pint of alcohol, pack it firmly in a glass funnel, and pour on alcohol until a gallon of liquid has slowly passed. The lime having been slaked to powder by the addition of water, is added to the liquor and shaken at intervals for 24 hours. The alkaline reaction of the liquid is now removed by adding diluted sulphuric acid in slight excess, then filtered, and evaporated to three fluid ounces. After the evaporation the fixed oil separates on the surface as a crystalline stratum. The syrupy liquid was mixed with four ounces of water, thrown on a wetted filter, and sufficient water added afterwards to make the filtrate measure half a pint. This liquid, which had an amber color, a strong, disagreeable odor, and bitter acid taste, was agitated thoroughly with a fluid ounce of chloroform, and the latter decanted. A fluid ounce and a half of chloroform was again added, followed by repeated portions of liquor potassæ of half a fluid ounce each, agitating well after each addition until the aqueous liquid on standing has a decided alkaline reaction and ceases to be clouded by the potassa. The chloroform is now decanted, and by spontaneous evaporation yields a crystalline fawn-colored residue of impure atropia, weighing 36 grains. By agitation with an additional portion of chloroform, three grains more of impure atropia is obtained. The atropia in this condition is dissolved in alcohol, shaken with half a drachm of purified animal charcoal, and after filtration mixed with a few drops of water and allowed to evaporate and crystallize.

The yield of purified atropia does not exceed 30 grains, or less than one-third of one per cent. of the root treated.

By evaporating the chloroform washings the fixed oil is obtained. This and the previous portion obtained by ether was redissolved in ether, filtered and evaporated by a gentle heat. The product was fluid at summer heat, had a dark brown color and disagreeable odor, and is at least partially the cause of the odor of the root.

Philadelphia, June, 1860.

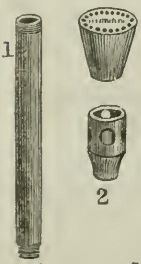
APPARATUS FOR THE USE OF GAS AS FUEL IN PHARMACY.

By Edward Parrish.

No kind of fuel offers to the pharmaceutist, in the small processes of his shop and laboratory, such advantages and facilities of adaptation, as the carburetted hydrogen gas, supplied to most towns and cities for illumination. Where it is obtainable, this gas is generally cheaper than alcohol, less wasteful to use, and if properly applied, equally cleanly; in comparing it with any of the cheaper forms of fuel, its great facility of application, the fact of its being so readily ignited and extinguished, leaving no solid residue, and requiring no flue to carry off the gaseous products of its combustion, render the question of its mere cost comparatively unimportant.

As far as my observation has extended, these advantages have been so far appreciated as to lead to the employment of some form of gas-heating apparatus in almost every pharmaceutical store, where manufacturing is carried on; in laboratories for analysis and for practical instruction, this is equally the case, and in an immense variety of processes in the arts, and occasionally in cooking, and the warming of apartments, this widely diffused fuel is employed.

It would extend this essay too much, and be foreign to its immediate object, if I should attempt a description of the various forms of gas-heating apparatus in common use; a notice of many of these will be found in the late edition of my work on Pharmacy. Nearly all are constructed on the principle of introducing atmospheric air with the gas into a cylinder, at the top of which it is lighted over wire gauze. Some, of recent construction, promote the thorough admixture of the gas with air, by modifications of the shape of the cylinder, or by forcing a draft of air through it; others by combining several small cylinders (Bunsen's) into one stove, or by terminating the ordinary Bunsen burner with a perforated disc, derive increased heat from the jet of gas, though often with a greatly increased consumption.



This cut represents McGlensy's patent, which is a modification of the Bunsen burner. Figs. 1 and 2 show a simple brass cylinder, with attachment for the introduction of the gas and a current of atmospheric air. The orifice of the burner is about $\frac{1}{4}$ of an inch above the top of the holes for the admission of the air, an important feature in determining the degree of force of the upward column of mixed air and gas. When this burner is used as a blow-pipe, or for any purpose requiring a concentrated heat, the gas is ignited at the top of the cylinder, and the flame burns with a slight blue color, and without smoke, rising under the full pressure three or four inches above the top.

The other figure represents a perforated disc for diffusing the flame, which constitutes McGlensey's improvement. This is an advantage for heating liquids in vessels, or cast iron plates such as are used for batter cakes, for heating sad-irons, or for radiating heat, as in warming apartments. These burners are highly recommended by many who use them, and are of a variety of sizes, burning from four to twelve or fifteen cubic feet per hour. It is claimed that one of them will boil a quart of water, in a tin vessel, in ten minutes burning, at the rate of four cubic feet per hour.

For the purposes of the pharmaceutist, it is a desideratum to be able to get a high or low heat at pleasure, and except in a very few instances it is not desirable to concentrate the flame upon a limited surface, so that many of the appliances which produce the most complete and intense combustion of the gas are not well suited to his wants.

In studying this subject with reference to my own wants, and endeavoring to meet with a perfect form of apparatus for evaporation, decoction, and all the other applications of heat in the shop, I met with a furnace of English pattern upon which I think I have made an improvement, fitting it admirably to the ordinary uses of the pharmaceutical shop and laboratory. This is here figured.

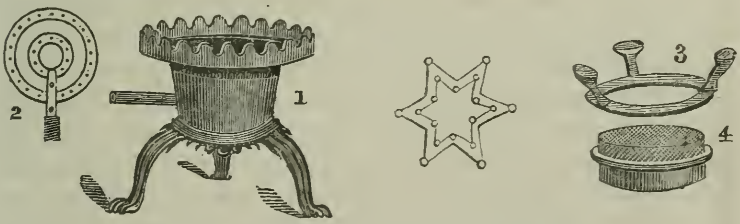


Fig. 1 represents a small cast iron furnace of an English pattern, originally obtained from Smith & Phillips, London, into which passes, through a lateral opening, a burner of two rings, fig. 2, perforated at suitable distances with small holes. For all purposes requiring a moderate and diffused heat, as in the evaporation of the extracts and fluid extracts, and the distillation of the distilled spirits, this answers an admirable purpose. The scolloped rim allows the free passage of a draft of air from the flame when the furnace is covered by a receiving vessel, while the distance of the receiving vessel from the flame prevents the deposit of soot upon it, unless when the flame is near its highest, which it need not be for the purposes named. The star is a casting for laying over the throat of the furnace, adapted to holding small flasks or capsules over the jets of flame.

Fig. 3 and 4 represent two rings of cast iron, the lower of which fits accurately in the throat of the furnace, and is covered with wire gauze; the upper is a flange with projecting arms for supporting vessels over it, and secures the gauze upon the inner ring.

I have added this contrivance with a view to operations requiring a more elevated temperature than that furnished by the combustion of the gas in jets from the ring-shaped burners. Being open at the bottom, the furnace allows a free ingress of air to mix with the gas, which being ignited above the diaphragm of wire gauze, produces perfect combustion without the least smoke, and with increased evolution of heat. The three upright supports attached to the outer ring will bear a heavy receiving vessel, and at the right elevation from the flame on the surface of the wire gauze.

This furnace may, of course, be connected by flexible tubing with the gas pipe from which it is supplied, and may be moved about on the counter or floor. Ordinary gum elastic hose may be very well slipped over the lateral pipe and on to an ordinary burner, without any metallic connections, ground burner, or mercury cup, the flow of gas being regulated by the stop-cock on the permanent gas fixture to which it is attached. The consumption of gas by this burner under ordinary circumstances of pressure, with a full head turned on, is from seven to ten cubic feet per hour, though this head will smoke without the use of the wire gauze attachment; for evaporation, without the attachment, a much smaller consumption is required. An idea of the heating capacity of the full head may be gained from the fact that a gallon of water in a pharmaceutical still of tinned iron, placed on the projecting arms over the wire gauze, was raised to the boiling point in thirteen minutes, though in an uncovered enamelled iron vessel it required near twenty minutes.

One advantage from the use of this furnace, without the wire gauze attachment, for operations requiring a low heat, is that the jets are not materially affected by the wind, which on a surface of wire gauze is apt to blow out the flame whenever much reduced. The cast iron rings are also an improvement on common methods of adjusting, securing, and renewing the gauze; no tripod is necessary for supporting the vessel to be heated, either with or without the wire gauze arrangement, and the strength and durability of the whole apparatus recommend it above the ordinary iron, tin, or even copper cylinders.

ON THE PREPARATION OF EMPLASTRUM ASSAFŒTIDÆ.

By William Procter, Jr., of Philadelphia.

(From the Proceedings of the American Pharmaceutical Association—1860.)

The following remarks are in reply to the tenth query of the list of questions offered at the meeting of 1859, viz :—

> "What is the best process for preparing Assafœtidæ Plaster so as to preserve the activity of the drugs unimpaired?"

The present process for this plaster (U. S. P.) is as follows :—

"Take of Assafetida, Lead-plaster, each a pound.
Galbanum, Yellow-wax, each half a pound.
Alcohol, three pints.

Dissolve the assafetida and galbanum in the alcohol by the aid of a water bath; strain the liquor while hot, and evaporate to the consistence of honey; then add the lead-plaster and wax, previously melted together; stir the mixture well, and evaporate to the proper consistence."

Theoretically, about two-thirds of the weight of assafetida is soluble in alcohol; practically, even with the aid of heat, the residue is quite bulky, even when the gum-resin is malaxated in a mortar with the solvent; and the tears are difficult to disintegrate without that precaution. If this residue is separated and washed with alcohol, and the alcoholic liquid evaporated with care, and incorporated with the melted ingredients as directed, a good plaster results. The objections to the process are the slow action of alcohol, and the greater or less loss of volatile oil by the evaporation, if at the temperature of the water-bath. In view of these objections the use of other solvents has been suggested. *A priori*, benzine, so noted for its solvent action on resinous bodies, was supposed to be a cheap and appropriate menstruum, and was tried, but found to be entirely inapplicable, as its solvent action was very slow, hardly altering the shape of the particles or fragments. Chloroform was next used with entire success; it rapidly broke down the gum-resin, dissolving all its oily and resinous matter and leaving the gum as a flocculent powder. The proportion tried was two parts, by weight, to one of the resins, which were operated on separately to ascertain the relative solvency in the menstruum, and they were found equally affected by it.

Ether was then tried and found to greatly exceed alcohol in its ability quickly to dissolve out the resinous matter from the gum-resins, but was required in larger proportion than chloroform. Brandes found two resins in assafetida; one of which, existing in small proportion, was insoluble in ether and tasteless, and, although the residue left by ether is more bulky than that of chloroform, its much lower cost is greatly in its favor as a menstruum. The great volatility of both these liquids enables the evaporation to be spontaneous, if operating in small quantities, or, if the liquids are to be recovered by distillation, permits of its being done by a water-bath, without injuriously volatilizing the essential oils.

But the assafetida plaster frequently met with differs from that of the U. S. Pharmacopœia, by containing the gummy as well as resinous part of the drug,—apparently being made by liquifying the assafetida by a hydro-alcoholic menstruum and straining out any gross impurities, and then concentrating to a thick consistence before incorporating with the plaster and wax. Such plaster, when melted with the plaster spatula, is apt to coagulate or separate, owing to the infusibility of the gummy particles.

In view of these results, the following modification of the officinal formula is offered for acceptance:—

Take of Assafetida,
Lead-plaster, each, twelve ounces.
Galbanum,
Yellow-wax, each, six ounces.
Ether, three pints.
Alcohol, a pint.

Thoroughly bruise the gum-resins in a mortar, put them in a suitable bottle, pour on the ether, and agitate frequently until the oleo-resinous portion is dissolved and a fawn-colored pulverulent residue remains as a sediment. Having placed a close cotton flannel or lint filter in a suitable funnel, empty the contents of the bottle in it and cover it closely. As the ethereal liquid gradually disappears, pour on the alcohol, and when it has ceased to pass, evaporate or distil the filtered liquid with a gentle heat until it acquires the consistence of honey and has lost an ethereal odor. Then, having melted the lead-plaster and wax at a moderate temperature, add the oleo-resins and stir constantly until cooled. Thus prepared, assafetida plaster has a fawn color when recent, which darkens by age and exposure; it has a decided odor of both drugs, and is efficient as a topical anti-spasmodic. The well-known change of color, or reddening, which the principal resin of assafetida undergoes by contact with the atmosphere, soon becomes apparent in the evaporated resinous extract from the gum-resins, and it is desirable not to expose the mixture longer than is needful to accomplish the evaporation of the ether and alcohol.

Philadelphia, September, 1860.

ON GARLIC—(ALLIUM SATIVUM.)

By Robert P. Thomas, M. D.,
Prof. of Materia Medica in the Philadelphia College of Pharmacy.

(From Proceedings of the American Pharmaceutical Association—1860.)

(*With a plate.*)

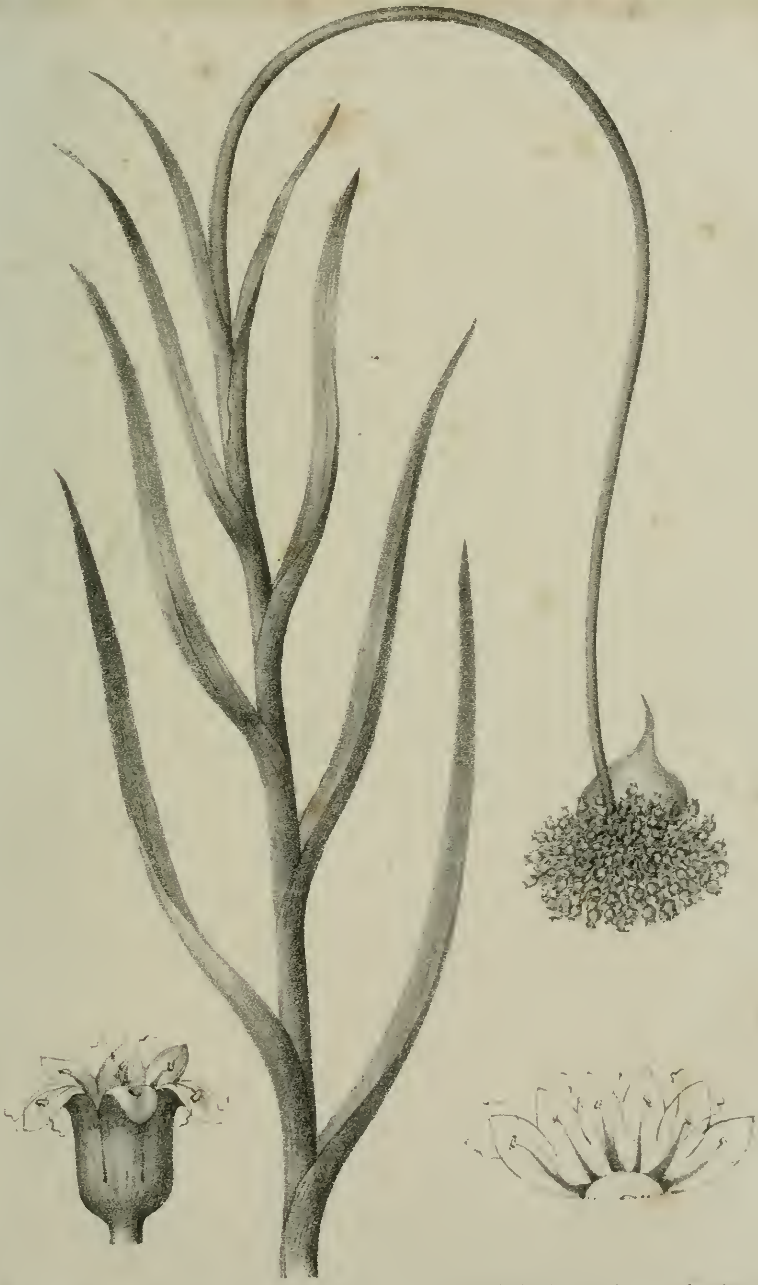
At the last Annual Meeting of the Association, the query whether "the varieties of garlic in use in Philadelphia are modifications of the same plant, or distinct species," was referred to me for investigation. It may be premised, that we constantly meet in the stores of this city, as well as upon the vegetable stands in the market-houses, with bulbs of garlic, so different from each other in size and general appearance, as to have occasioned much speculation respecting their origin.

With a view of eliciting the practical experience of market-gardeners upon this subject, extensive inquiries have been made of those engaged in the cultivation of garlic, but the information thus obtained is so diverse and conflicting, as to be of little positive value. To the question: Do two varieties of garlic grow in your garden? the answer almost uniformly has been—We only raise one, but there is a great difference in the size of the plants and roots. The general impression among them seems to be, that no real difference in species exists, the diversity in size being referable to circumstances,—such as the nature of the soil, quantity of manure, &c. A similar diversity, it is said, is witnessed in the growth of all the vegetables cultivated for daily table use.

One gardener, somewhat celebrated for her knowledge of horticulture, informed me that the two plants were certainly not identical, as she could readily distinguish them in the growing state at a distance of many feet. It being evident that no conclusive evidence could be procured on the subject, I resolved to raise a few plants and thus obtain some tangible proof. Accordingly, four cloves of one of the large bulbs, and a similar number of a small one, were planted in a large garden at considerable distances apart, and all were so marked as to prevent a subsequent confounding of the different plants. Each grew vigorously, but before they had obtained half of their growth, a striking difference between the produce of the respective bulbs was evident to the observer, and a confirmation afforded of the remark quoted above, that the growing plants could be distinguished from each other at a distance of many feet, indeed, I might say, as far as they could be seen. The one presented all the characteristics of the true garlic; the other looked so much like thriving onion-plants, as to be constantly mistaken for them by casual visitors. The close observer, however, noticed that the ventricose stem of the onion was wanting, being replaced by the round solid stem of the garlic. Between the large plants, and the leek (Allium porrum,) the resemblance was still more apparent. It may be mentioned that the four plants derived from the cloves of the large bulb presented like characters; while the progeny of the small bulbs were also accordant in their peculiarities, but dissimilar to the offspring of the large. The period of inflorescence was not alike in both; the small or true was variety in head ten days or two weeks inadvance of the large.

The following description of these varieties, made from recent specimens, is arranged in such a manner as to enable the eye of the reader to recognize the close correspondence in the written histories of two plants, which in their growing state presented such striking differences in size, general appearance, and time of inflorescence.

SMALL OR COMMON GARLIC.	LARGE GARLIC.
Bulbs, compound, small, consisting of eight to twelve cloves of nearly uniform size, surrounding the stem, and enclosed by common membranous envelopes. Each clove has, also, its own specific covering. The bulbs range from ¾ of an inch to 1¾ of an inch in diameter.	*Bulbs* compound, large, some weighing four to six ounces, and measuring two to four inches in diameter. Cloves, four to eight in number. Four of them are usually well developed, the remainder are much smaller. Each has its own covering, and all are arranged around the



er, highly magnified

Perianth laid open, showing the alternate trifid stamens

ALLIUM SATIVUM [HYBRID]

In both varieties the cloves present a concentric arrangement internally, and a small, vertical canal in the centre.	common stem, with common membranous envelopes.
Stem round, herbaceous, 2 feet—2 feet 6 inches high, $\frac{1}{3}$—$\frac{1}{2}$ inch in diameter at base, lower third sheathed with leaves.	*Stem* round, herbaceous, 5—6 feet high, one inch in diameter at base, lower third sheathed with leaves.
Leaves, sheathing, linear, lanceolate, 12—15 inches long, $\frac{1}{2}$—$\frac{3}{4}$ inches broad, nearly flat, though somewhat channeled above, striate, smooth, entire, margins bordered by very fine stiff hairs.	*Leaves*, sheathing, linear, 18—24 inches long, 1$\frac{1}{2}$ inches broad, midrib prominent below, striate, smooth, entire, margins and midrib clothed with very fine stiff hairs.
Spathe, ovate, membranaceous, with a long acumination.	*Spathe*, ovate, membranaceous, with a long acumination.
Flowering heads umbelliferous ; the flowers being intermingled with numerous spathaceous, proliferous bulbs.	*Flowering heads* umbelliferous; the flowers being small and numerous. No bulbs are found in these heads.
Pedicels, pale purple, $\frac{1}{2}$—1 inch long.	*Pedicels*, pale purple, slender, 1—1$\frac{1}{2}$ inches long.
Perianth, pale purple, 6-parted.	*Perianth*, pale purple, 6-parted.
Filaments 6, viz., 3 single, and 3 tricuspidate. Anthers incumbent.	*Filaments* 6, viz., 3 single, and 3 tricuspidate; the alternate filaments being wide at base, and bearing the anther on the middle filiform segment. The alternate stamens are longer than the perianth.
Ovary, superior; capsule 3-celled.	*Ovary*, superior; capsule 3-celled.
Style, subulate.	*Style*, subulate.
Stigma, simple.	*Stigma*, simple.
Flowers early in July. Fruit, latter part of August.	Flowers late in July. Fruit, in September.

The foregoing comparison of the plants yielding the two kinds of garlic, shows a strict accordance between them on most botanical points. It will be observed, however, that the stem, leaves, and bulb of one are nearly twice as large as the corresponding parts of the other. Furthermore, neither of the four large plants presented a single bulb in the flowering head, while every one of the plants, from small root-bulbs, exhibited many of them in each head.

In smell and taste they also differ, the large variety bearing more resemblance in these respects to the leek, than to the true garlic.

As the genus Allium includes more than sixty species, botanists have found it necessary to adopt several subdivisions in the grouping of the species; and one ground of separation, adopted in Miller's Gardener's Dictionary, is founded on the presence or absence of bulbs in the flowering tops. According to this arrangement, there would be perfect propriety in considering the two plants in question as belonging to different species. But a careful examination of the entire plants shows that such a classification would be incorrect; for, although differing in one important particular, they harmonize exactly in many others.

All of the aerial portions of the large plant exhibit a striking similarity with the corresponding parts of the leek, while the underground portions bear an equally close resemblance to the true garlic.

Not being able to find in any of the standard works on botany the proper authority for considering the two plants as representatives of distinct species, and being satisfied from my own observations that they are not the same, I am led to the conclusion that the large plant may be justly esteemed as a hybrid, partaking of the nature of the garlic and the leek.

Entertaining this view, it is easy to account for the opinions of the market-gardeners, who speak of them as being identical. The hybrid, having been once formed, would be self-propagating from its cloves, which being planted indiscriminately with those of the true garlic, would produce, from year to year, a mixed crop, in which the unsuspecting eye would recognize no other difference than that of size; the cultivator merely supposing that he has large and small bulbs, from accidental circumstances of growth, just as he has large and small potatoes produced from similar eyes.

[Since this article was printed in the Proceedings of the Association, Dr. Thomas has made the following further observations in reference to the imperfect fruiting of the new garlic.—EDITOR AM. JOURN. PHARM.

Capsule supported by the persistent *perianth*, 3-angled, splitting at the angles into three valves. Each valve is subdivided by a central dissepiment into two compartments, each of which contains a single aborted seed. The capsule is 3-celled, each cell being completed by the junction of two adjacent valves. A careful examination of the capsules of two entire heads failed to detect a single perfect seed.]

REMARKS ON THE PREPARATION OF SOME NARCOTIC EXTRACTS.

By WILLIAM S. THOMPSON.

In the Pharmacopœia of 1850 the extracts of the leaves of several narcotic plants, viz.: aconite, belladonna, conium, hyoscyamus and stramonium, are directed to be prepared after two different methods: first from the fresh leaves by inspissating the juice previously heated to the boiling point to remove he albumen. Preparations of this class are termed *extracts*. Extracts of the other class are designated by the prefix *alcoholic*, and are prepared from the dried leaves treated by percolation with diluted alcohol. Of the two processes the latter is doubtless preferable, and when the plants are gathered at the proper period and carefully cured, afford preparations unexceptionable, both as to therapeutical efficacy and permanence of condition.

In England where the cost of alcohol is so great as to almost preclude its use in the preparation of extracts, the plan of preparing them from the juices of fresh plants is extensively practised. In this country, where there is no excise duty on alcohol, it is within the reach of every pharmaceutist at a comparatively low price, and no good reason exists why the inspissated juices or watery extracts should be retained in the Pharmacopœia. Of the superiority of the alcoholic extracts in point of medicinal efficacy there cannot be a doubt, as numerous practitioners of medicine in this city can testify from actual experience. No better evidence of the uncertainty of the inspissated juices or watery extracts, can be given than the statement of Pereira, who, after alluding to the processes of the British Pharmacopœias for extract of hyoscyamus, says: "The quality of this preparation as met with in the shops, is extremely variable. This arises principally from the unequal care with which it has been prepared. The dose is from gr. v. to ℈j; occasionally much larger doses have been taken without any injurious effects." Speaking of the same extract Prof. Wood says: "Like all the inspissated juices it is of variable strength, according to its age, the care used in its preparation, and the character of the leaves from which it was procured." With such testimony as the foregoing as to the uncertainty of strength of the inspissated juices, may not the questions be asked with propriety, why should they retain a place in the Pharmacopœia? and in view of the more certain and uniform strength of the alcoholic extracts, why should not they be exclusively used? In the latter case, physicians would not be under the necessity of testing the strength of each new sample, by gradually increasing the dose until the desired effect is experienced. With reference to the permanence of these extracts made by the alcoholic process, my own experience has been that they keep well, and undergo very little change, except in losing their soft condition to some extent when kept in a warm place. Alcoholic extract of aconite has been known to act promptly and efficaciously after having been prepared at least ten years. On the contrary, inspissated juices have been known to become mouldy and to acquire an odor not natural to the plants from which they were produced; thus showing that they were undergoing decomposition, and that they contain within themselves the element capable of producing it. Medical men have frequently been heard to complain of the inefficiency of extract of belladonna, when used for dilation of the pupil, the preparation in question being the inspissated juice; while on the contrary, the alcoholic extract has been known to act promptly in the same case. Numerous instances might be cited to prove the superiority of the alcoholic extracts, but the matter being in the hands of the Committee of Revision of the Pharmacopœia of 1860, will no doubt receive proper attention.

It is now proposed to vary from the process of the Pharmacopœia in the preparation of alcoholic narcotic extracts, as follows, taking for the type extract of hyoscyamus:

Extract of Hyoscyamus.

Take of Hyoscyamus leaves in coarse powder, 12 ounces.
Alcohol, ... 2 pints.
Water, a sufficient quantity.

Moisten the powdered hyoscyamus leaves with part of the alcohol, let it stand 24 hours in a covered vessel, then transfer to a displacer, and add gradually the remainder of the alcohol; reserve what passes through after the addition of the alcohol, and set it aside for spontaneous evaporation. Displace the remainder with water to exhaustion; evaporate this portion in a water-bath to the proper consistence; and add the portion which was previously set aside, and mix the whole thoroughly. The other narcotic extracts may be prepared in the same manner.

By adding strong alcohol to the leaves at the commencement of the process, the chlorophylle or green coloring matter of the leaves is extracted, which when added to the other portion and thoroughly incorporated with it gives the extract a fine green tint, without affecting its sensible properties or adding materially to its weight. Stramonium ointment of very superior quality, fine color and appearance may be made from extract of stramonium prepared after the above manner.—*Jour. Md. Col. Pharm., Sept.*, 1860.

ARSENIC IN A DRINKING WATER.—NOTE ON THE ARSENICAL WATER OF WHITBECK, CUMBERLAND

By Arthur H. Church, F. C. S.

The recent reliable accounts of arsenic eating in Styria, the controversy as to the effect on the Thames water of arsenical perchloride of iron, and the detection of arsenic in numerous mineral waters and deposits, invite special notice to the occurrence of this element. And now that the influence on the animal economy of arsenic in minute but repeated doses is attracting so much attention, I think that the following account, incomplete as it at present is, of an arsenical drinking water, will prove interesting. My attention was first directed to the subject by the Rev. Mr. Wilkin, of Booth, to whom, as well as the Rev. Mr. Ormandy, of Whitbeck, and Dr. Fidler, of Whitehaven, I am indebted for much information and assistance.

From the northern and western sides of Black Combe, a mountain in the southern part of Cumberland, situated near the sea, numerous streams or *becks* originate; I believe that one only of these exhibits any marked peculiarity. Whitbeck, such is the name of this stream, is fed by several small springs, and it was from the source of the most southerly of these where it rises from the ground, and at an elevation of about 900 feet from the sea, that I obtained a specimen of the water for examination. On the 29th of June in the present year, the water, at the time of collection, had a temperature of 8° 5′ C., the air being 10° 6′. The reaction of the water as it issues from the earth was faintly but unmistakeably alkaline: on testing the water after ebullition the effect was more decided. The water from many other sources in the neighborhood of Whitbeck, where decomposing granite is of common occurrence, has an alkaline reaction. A large and deep pool in the course of Whitbeck towards the sea shows the color of the water to be a rich clear greenish blue.

The water, on examination, gave distinct indications of the presence of arsenic. This element, which here probably exists as an alkaline arsenite, occurs not as a mere trace, but in determinable quantity. I have not yet ascertained the amount present, but hope to do so shortly, when I have obtained specimens of the water collected at different seasons of the year. I have satisfied myself, however, that in some seasons of the year the quantity present approaches a good fraction of a grain of arsenic (metallic) in each gallon of water. At the same time I am desirous of furnishing complete analyses of some interesting minerals obtained from the vicinity of the spring.—For on ascending the gulley, a few yards above the source of Whitbeck, we arrive at the entrance to a mine, which, some years ago, was worked for cobalt and copper, and is now again being searched. Here I obtained very rich and massive silver-white arsenical cobalt ore, and also copper pyrites. The neighborhood for some miles is in fact rich in minerals. Dr. Fidler writes: "Almost immediately behind Whitehaven Parsonage a sulphur vein crops out, a continuation of the same vein that is being worked at Under Hill, but whether it exists in any quantity I do not know. There are three or four copper veins in a ravine behind Whitehaven Mill, one of which has been tried some twelve or fifteen fathoms below the surface." Baryta, also, has been found I am told, above the source of Whitbeck in the mine above-mentioned.

It will be seen that the arsenic in the water of Whitbeck is thus most probably derived from the veins of arsenical cobalt ore through which it percolates.

The arsenical water is *habitually used for every purpose* by the inhabitants of the little village of Whitbeck, and, as far as I can learn, with beneficial rather than injurious results.—But it is remarkable that Whitbeck, though in every respect suitable for trout, is the only stream in the neighborhood from which that fish is absent; eels, however, have been found in it. Ducks will not live if confined to this arsenical water. When the railway was being carried past Whitbeck, the first use of water quickly produced the usual marked effect on the throats both of the men and the horses employed on the works. The soreness of mouth from which they at first suffered soon, however, disappeared, and in the horses gave place to that sleekness of coat assigned as one of the effects produced by the administration of arsenic. It is a question how far the rosy looks of the Whitbeck children, and the old age which a large proportion of the inhabitants of the village attains, are to be attributed to the arsenic present in the water they drink.—*Chem. News, London, Aug.* 25, 1860.

THE ESSENTIAL OIL OF CITRUS LUMIA.

The Citrus Lumia, or sweet lemon, is common in Sicily and Calabria. In external appearance very like the common lemon, the fruit differs by containing a sweet instead of an acid juice.

The odor of the rind differs too from that of the common lemon, and also from the orange; it resembles bergamotte, but is not so powerful. The oil is prepared at Squillace, in Calabria, by pressing the rind of the fruit. It has a very deep yellow color, but, when distilled, the coloring matter remains in the retort. The first portions distil between 130° and 180°, and they contain water; the greater part passes between 180° and 190; at a higher temperature vapors with an empyreumatic smell come over. The residue, and the first portion which passes, contain oxygenated compounds. M. de Luca, from whose paper we quote, has made the following experiments with the portion which, on rectifying the oil, passed exactly at 180°. It is lighter than water, and insoluble in it, but on agitating imparts its smell. It is slightly soluble in alcohol, and freely so in sulphide of carbon and ether. It turns the plane of polarisation to the right. Its sp. gr. at 18° C.= 0·853. The composition is represented by the formula $C_{20} H_{16}$. Mixed with alcohol and nitric acid it becomes hydrated, and in time furnishes a crystalline matter. Heated with nitric acid, nitrous vapors are given off and yellowish resinous matters are produced. Dry hydrochloric acid gas, as well as a concentrated solution of the same acid, act on it at the ordinary temperature, and furnish liquid and crystallised compounds, the crystallised compound being a bihydrochlorate, $C_{20}H_{16}2HCl$, for it contains about 34 per cent. of chlorine.—*Chem. News, London, Sept.* 1, 1860.

COMPOSITION OF CACAO.

Tuchen has analysed various specimens of cacao to determine the amount of theobromine they contained. His results are as under[5]:—

	Fatty matter.	Theobromine.	Ash.
Guayaquil . .	36.38	0.63	3.03
Surinam . . .	36.97	0.56	3.00
Caraccas . . .	35.08	0.55	2.92
Para . . .	34.48	0.67	3.00
Maragnow . .	38.25	0.38	2.92
Trinidad . . .	36.42	0.48	2.98

Chem. News, London, Aug. 11, 1860, from *Chim. Technol.*

ON A NEW FORM OF CHLORIDE OF SODIUM.

By Richard V. Tuson,

Lecturer on Chemistry at Charing Cross Hospital.

That chloride of potassium, which ordinarily crystallizes in cubes, is nevertheless often found as an efflorescence on various vegetable extracts assuming the acicular form, is well known. Hitherto, I believe, the corresponding compound, chloride of sodium, has never been observed in needle-shaped crystals, but nearly always in cubes. Occasionally, however, it deposits from urine in octohedra; and when a solution of the salt in water is evaporated at a temperature not exceeding 14° F., it crystallizes in hexagonal tables (Ehrenberg), which contain, according to Fuchs, six equivalents, but according to Mitscherlich, four equivalents of water of crystallization. At temperatures above 14° F. these hexagonal crystals lose their water of crystallization, and are resolved into a congeries of minute cubes. Chloride of sodium, it is also stated, may be obtained in large oblique rhombic prisms, having the formula $\mathrm{Na\ Cl.+4Aq}$. They effloresce in air below 32° F. (Mitscherlich), deliquesce (? effloresce) in air above 32° F. (Fuchs), and leave a powder of small cubes.

Lately, on opening a tightly-fitting tin box in which a quantity of salmon-roe paste had been allowed to remain for nearly three years, it was found that the organic matter was covered by an efflorescence of acicular crystals. One of my pupils collected some of these crystals, analyzed them, and pronounced them to consist entirely of chloride of sodium. As I had never heard of chloride of sodium crystallizing in needles, their examination was repeated, but still the same results were obtained. Some of the crystals were next dissolved in water, and the solution produced submitted to spontaneous evaporation, when the whole of the salt deposited in the ordinary, or cubical form. This result, therefore, fully confirms the conclusions deduced from analysis. The crystals, some of which are nearly half an inch long, appear to be rectangular prisms, terminated by four-sided pyramids. They are beautifully clear, transparent, colorless, elastic, longitudinally and transversely striated, and many are bent or contorted in a manner similar to the native hydrated sulphate of lime, called selenite by mineralogists. The acicular crystals are anhydrous, and undergo no change in form or diminution in transparency when exposed to air at ordinary temperatures, or even at a low red heat. The needles of chloride of sodium possess one property, which is a very familiar characteristic of the cubical salt, namely, that when heated they decrepitate.

It is singular to remark that, at all events, as far as we know at present, the acicular varieties of the chlorides of potassium and of sodium are only developed in the presence of organic matter, just as the production of octohedral chloride of sodium appears to be due to the solution from which it crystallizes, containing urea.

Since writing the foregoing, I have observed an efflorescence of acicular chloride of sodium on an animal deposit which was sent me for analysis, and which had been originally mixed with a solution of common salt to prevent its undergoing putrefaction.—*London Pharm. Journ. August*, 1860.

PHARMACY IN PIEDMONT.

By Sutton Sharpe.

A tour through Piedmont during the memorable days of last year's campaign, as a privileged follower in the footsteps of the French army, brought me in contact with our brethren in regions rarely, if ever, trod by the most erratic of our race. The rapid retreat of the Austrians across the Ticino, and the forced marches of the allied army in their pursuit, however, gave me few opportunities to obtain materials, as towns and villages were often passed in the dead of night, and it was only at Alessandria, Novara, and Turbigo, that the bivouac was sufficiently long to allow time for observation. But a still later visit in the less interesting capacity of *commis-voyageur* offered me every facility for examining into the condition and resources of the Piedmontese chemist; a mortal by no means the most enviable in the legion of Galen's disciples. The principle of compulsory examination has long existed throughout Europe, imposed with more or less severity as necessity may suggest; and one marvels that in England contending elements should have so long prevented the adoption of an ordeal amongst the best of the progressive tendencies of the age. The law in Piedmont, however, differs in many respects from that of France and Germany. In Piedmont every large town, Genoa, Nice, Chambery, and others, possess their laboratory and professors chosen from amongst the most eminent chemists of the place, and forming a local institution holding the same privileges as the supreme school at Turin, with the exception that to commence business in the capitol it is necessary to be a licentiate of its school, by far the most esteemed on account of the extended facilities offered to the student. Since the passing of an act in 1853, it is enforced that every one intended for the calling of a chemist must produce a certificate of bachelor from some recognized college, as a guarantee that his private education has not been neglected. An apprenticeship of five years is required, and if three of these be devoted to study and attendance at the laboratory and lectures, the student may present himself for examination; but it more frequently happens that only the last year of apprenticeship is at the student's disposal, after which we find him located for the remaining two years in some garret of unknown altitude in the Via San Carlo, or the miserable streets that surround the Tempio Valdese, the abject type of that race of *étudians* who people the Quartier Latin in Paris—youths with long hair and picturesque threadbare coats, poor, improvident, and ambitious, struggling with every necessitude of fortune, and exposed to vice in its most hideous form. But our poor Sardinian has not the resources of the disciples in Paris, and the ordeal through which he has to pass on the day of examination presses heavily on his mind, for it is only by unwearied application he will be prepared for the presence of that goodly host of *savans* who sit in the Via di Po, for the examinations are prosecuted with much severity. We were present upon one occasion when an unfortunate Genoese came to grief for not knowing that madder contained alizarin and xanthine, and another was plucked for his ignorance of the atomic theory and hydrometrical equivalents. Thinking men have long protested against the pernicious effects produced by examinations so purely theoretical, and which affect the best interests of the future man of business. Dr. Preuss tells us that the dragoons of

Frederick the Great were taught trigonometry, but we question if it ever served them on the battle-field, and whether at Molwitz they would have been so disgraced if they had been taught that which is useful before that which is beautiful. The Piedmontese chemist is eminently theoretical, and, at the same time, eminently poor; the atomic theory and hydrometrical equivalents do not aid him in a community of peasants, amongst whom, perhaps, he is destined to live. Science has exalted him above the sordid details of every-day life, and the philosopher's stone is an elusive research which brings no grist to the mill.

The number of pharmacies is limited according to the population; thus we find in a statistical table, in the *Giornale di Farmacia*, of January, 1859, the proportionate number of chemists in the towns and provinces. Turin, with a population of 179,600, has 50 pharmacies, yielding 3592 for each. In Nice there is one for every 2629; in Novara, one for every 1810; while at Cuneo and the villages, where the inhabitants are isolated, the number of inhabitants to each pharmacy sometimes reaches 4000. The restrictive character of this provision, to protect the chemist from a destructive competition, necessarily gives increased value to houses of reputation in populous towns; and at Turin large sums, exceeding sometimes three or four thousand pounds, are paid for a business and patent. Few young men, however, can be found with capital sufficient for entire purchase, so that a system is general throughout the states, by which the payment is extended over a period varying from ten to twenty years, secured upon the property, which, by the protective law, cannot decrease in value; but this facility of payment has the result of giving a false value to a business, which, after all, yields but a miserable return. The pharmacies are examined annually by government inspectors, who investigate the quality of the drugs employed, and that all poisons and active preparations be kept separately and under lock and key, according to the regulations of the act. But the most lamentable obstacle against which the man of business has to contend, is the tariff instituted by the Council of Health in 1853, for the regulation of the price of medicines and pharmaceutical preparations, and which produces the most pernicious effects, and paralyses the efforts of those who, by a healthy competition, seek to rival their less intelligent neighbor. This tariff, open to public inspection in every pharmacy, has for its end the prevention of exorbitant prices, by a fixed standard, unaffected by the fluctuations which continually occur in almost every product, and which in reality has the effect of creating imposition rather than subduing it; thus the authorized price of quinine is two shillings and sixpence the scruple, camphor more than a shilling an ounce, which could be sold for half the price, while many products in this anomalous scale are marked much lower than cost price. Leaving Turin, with its neat-looking pharmacies, decorated with mahogany fittings, white marble counters, and graceful urn-like vases, rich but not gaudy, one is surprised at the extreme poverty one encounters at Genoa, the richest city in the state, and of a commercial importance exceeding any other town on the Mediterranean, Marseilles excepted. The best chemists' shops in the place, to which the much-vaunted establishment of Mojon scarcely forms an exception, resemble the *spezierie* in the almost deserted districts of Vicenza and Verona, where one feels oppressed by a sense of poverty or some worse curse, resulting from Austrian domination, which seems to cripple the vitality of every enterprize—*boutiques* ~~that~~ that would disgrace the oft-calumniated districts of St. Giles and the Minories. This indigence is accounted for at Genoa by the active competition of several wholesale drug warehouses, which, besides alimenting the provinces with their products in parcels resembling the "foul linen" of some disorderly bachelor tied up by the four corners, retail to the Genoese public *à buon prezzo*, much to the detriment of the legitimate vendors. But it is in the interior where the pitiful condition of our brethren would draw forth sympathy from the most uncharitable, where Romeo would have found a hero at every step "in tatter'd weeds," with overwhelming brows, the type of that fragile wretch at Mantua who sold poison against the law, forced by grievous fortune to confess "my poverty but not my will consents." It is at Tortano, Voghera, Aste, the land of effervescing white wine and shoeless women, Savona, Moriana, Pallanza, where almost every pharmacy tells a tale of woe; its small front filled with miniature squares of glass, painted black, often untouched since its foundation, as if in mourning for a liberal profession fallen low from its high estate, the brick or flagstone floor, ill-shaped bottles filled with mysterious liquids, and labelled with the vilest caligraphy, and about his shelves a beggarly account of empty boxes, green earthen pots, and, lastly, the pale, mysterious-looking proprietor, wearing a low-crowned Turkish-looking hat, eternally smoking in his little back room, often unmoved by the spasmodic ringing and knocking of him who may require his aid, a passive creature of the present, forgetting the future while he indulges in his *dolce far niente*—a curse that enervates the whole Italian family. The resources are limited, medicine is not *à la mode*, life is less artificial in the interior, retaining even primitive simplicity, medicinal plants everywhere flourish, and which instinct or custom has led a great part of the population to employ. The pulp of tamarinds and cassia are the popular remedies—the panacea for all the ills that "flesh is heir to." Their belief in medicine rarely reaches to Epsom salts, while rhubarb and magnesia are looked upon as contemptible drugs; thus in the provinces the pharmacien is reduced to the necessity of retaining for sale a host of articles not less numerous than the miscellaneous horrors of a marine store. Even in Alessandria, a town of fifty thousand inhabitants and a strong garrison, the principal chemist of the place, who resides in the Piazza Largha, would fail to obtain a living were it not for the accessories of an Italian warehouse—tea, coffee, sugar, &c.; and we know a chemist in a not far distant town who exercises the functions of altisonant town crier, while another is a renovator of faded habiliments. During the short days of last year's invasion the unfortunate chemist was generally the first victim of Austrian exaction; the secret of his varied resources was found out, for his shop contained a little of everything; as the rapacious Yagers expressed themselves, "Diese apothecker, haben ein wenig von allem;" and although his shop contained few drugs, which were invariably respected, butter, cheese, and dubious-looking anchovies were in abundance. Well do I remember at the battle of Palestro, in company with a surgeon of the 3rd Zouave Regiment, pushing our way into the village through hundreds of dead and dying in search of a little ammonia to apply to a poor sergeant who had fainted from loss of blood resulting from a flesh wound in the thigh, for the ambulances were still in the rear; the shop was deserted, but we espied the eye of the proprietor glistening through the gratings of a dark cellar where he had hid himself; there was still desultory firing on the left upon the retreating Austrians, who had evacuated the town, chased at the point of the bayonet by the impetuous Zouaves. Although assured everything was safe, entreaty failed to tempt him from his hiding-place until a Sardinian regiment marched past; he opened his shop, and to our astonishment no ammonia was to be found, its use had not penetrated so far from the capital; but a collection of Jew's-harps and fishing-rods, loaves of sugar and lamp wicks, seemed to banish every suspicion that it was a pharmacy.

Once more at Genoa, I took the good ship Dante to Nice, where a vast influx of strangers has given an impulse to every branch of industry, and which boasts of three of the handsomest pharmacies in Europe—Pauliau's, Ferrara's, and Mussi's, the latter of which I have the honor to manage.—*London Pharm. Journ. August*, 1860.

PROXIMATE ANALYSIS OF "KAMALA."

By G. Leube, Jr.

While experimenting with kamala, the author obtained 28·85 per ct. of ashes, which differs so materially from Anderson's results of 3·84 per ct., that the analysis of the latter (Ph. Journ. and Trans. xvii. 495) appeared doubtful. Mr. Leube undertook an analysis, the results of which are contained in the following:—

Fifty grms. were displaced with ether; the dry residue weighed 26·850 grms.; on evaporating the red liquid it retained its clearness and left a resin, which was boiled with water. The filtrate from this had a yellowish color and an acid reaction, and contained some sulphate of lime, but no ammonia. Acetate of lead caused a precipitate, and by the subsequent neutralization of the acid liquid with ammonia, a little resin, and the lead salts of citric acid and of a tannic acid, which yielded with sesquichloride of iron a green brown precipitate, were thrown down.

The filtrate from the lead precipitates was treated with carbonate of ammonia, and filtered from the carbonate of lead. The liquid was tested for lactic acid and sugar, with negative results.

The dry resin, after the treatment with water, weighed 22·8 grms.; it appears to contain the active portion of the constituents of kamala. It is soluble in boiling alcohol; about one-fifth separated on cooling, with a somewhat lighter reddish yellow color. Both portions are brittle, soluble in caustic potassa with a red color, and precipitated by acids without alteration; with the aid of some heat they dissolve in ammonia and alkaline carbonates. The readily soluble resin fuses at 80° C. (176° F.), the other at 191° C. (376° F.) They could not be obtained in a crystalline state, are not glucosides, yield with nitric acid oxalic acid, and left ·6 and .4 per ct. ashes, respectively. The chemical composition of the first resin is $C_{30} H_{18} O_8$; of the second, $C_{16} H_{12} O_{10}$. The color appears to be peculiar to the resins. Dr. Anderson's rottlerin could not be obtained.

The above residue of 26·850 grms. had the color of hydrated sesquioxide of iron. The alcoholic tincture yielded a small quantity of a brittle resin, soluble in ether and ammonia; no further attention was paid to it. Boiling water extracted from it neither sugar, lactic or citric acid; otherwise the solution showed the same behaviour as the aqueous decoction of the ethereal extract.

25·460 grms. were left after the treatment with alcohol; no albumen or sugar could be detected. After boiling with water, a residue of 23·450 grms. remained behind. The decoction contained a little starch, gum and so-called extractive; it had a brown red color and an insipid taste.

After digesting, with diluted muriatic acid, the dry residue weighed 19·700 grms.; the filtrate contained oxalic acid, sesquioxide of iron and lime.

On treating the residue with potassa, and precipitating the deep brown filtrate with muriatic acid, the precipitate was blackish brown, brittle, of a resinous lustre, and evolved ammonia, along with empyreumatic products when heated in a test-tube; it was a humus-like acid, with some albuminous matter.

The dried residue now weighed 16·340 grms. and yielded

12·5 grms. ashes,—chiefly composed of sand and peroxide of iron.

A fresh portion of kamala left 28·85 per cent. ashes; composed of KO and NaO ·9, MgO ·2, CaO 4·1, $MnO+Mn_2O_3$, ·7, Fe_2O_3 8·5, SiO_3 (soluble) 1·2, SiO_4 (insoluble) 83·8, Cl and SO_3 traces; = 99·4.

The author recognized sand under the microscrope; but attributes its presence not so much to an adulteration, as to the dust adhering to the kamala during the growth of the plant and the drying of the fruit.—*Wittst. V. Schr.* ix. 321–330.—J. M. M.

ON THE PRESERVATION OF MEDICINAL PREPARATIONS.

By Jno. B. Enz.

After some introductory remarks upon the frequency with which spoiled drugs and preparations are met, and the necessity for adopting some means to prevent such losses, the author refers to Appert's method of preserving organic substances, and then gives his experience with this mode of preservation as adopted by him a number of years ago, without claiming originality for his suggestions.

1.—*Acidulous Juices and Syrups.*

Most pharmaceutists keep too large a stock of syrups. Though some keep very well, others alter their bright color, become turbid and ferment. To preserve the juices, the author uses Appert's method; the fermented and expressed juices are filled in vials, holding 4 or 5 oz., these are corked and immersed in boiling water for ¼ or ½ hour. The neck of each vial is dipped into fused wax so as to cover the whole cork and mouth, after which they are kept in a cool place protected from the light. Succus berberidis, ceras. nigr., ebuli, fragariæ, juniperi, limonis, mororum, myrtillorum, oxycocci, ribium nigr. and rubr., rubi idæi, rubi fruticosi, rhamni cathart., sambuci, and vaccin. vitis idææ, were kept in this manner, and showed no sign of alteration after a period of eight years; a little pulverulent matter had been separated; but the fluid possessed its original bright color and was perfectly clear and transparent. If the necessary amount of crystallized cane sugar is added, a clear syrup is obtained with the aid of heat, which needs no skimming or straining. I never prepare more than 12 or 15 oz. (by weight) of syrup: when used up, another bottle is opened, and so on. The advantage rests in the small quantity of sugar necessary at one time, and in the possibility of preparing the syrup whenever demanded.

With syrups prepared from liquids which are not previously subjected to fermentation, I follow a somewhat different method: I prepare the syrup according to the Pharmacopœia, fill it in 4 oz. vials, and treat the same as in the first instance. Such syrups are syrupus althææ, capillar. vener., cinchonæ, mannæ, mesembrianth. cryst., papav. alb., rhei, rhœados, senegæ, sennæ c. mann., sennæ, rosæ, violæ odoratæ, &c. For syrups prepared with wine, I recommend the same method, though they keep for a longer time than the others. Almond syrup is prepared by me as follows: the sugar is dissolved as well as possible in the cold strained emulsion, the solution is poured with constant agitation into 4 oz. vials, which are afterwards immersed in water of about 50° R. (145 F.) to complete the solution, and then sealed with wax. Thus prepared it may be kept for years.

2.—*Honeys and Inspissated Juices.*

The best method for clarifying honey is Rebling's method with tannin and lime water, to neutralize the free acid, whereby all foreign matter is removed, not a trace of tannin left behind, and the honey rendered perfectly clear. For compound honeys, such as Mel liquiritiæ, rosatum, tannatum, Mellitum cum succo mercurial. annuæ, the vegetable fluids are first to be filtered, and a clear honey is obtained, which is to be preserved like the syrups. The same applies likewise to the inspissated juices; when evaporated to a syrupy consistence, they are preserved by Appert's method; Succus ebuli, juniperi, sambuci, spinæ cerv. inspiss., &c., keep thus unaltered.

3.—*Distilled Medicated Waters.*

The medicated waters prepared from the volatile oils, as is well known, are not identical with the distilled waters. Cinnamon water, for instance, when distilled from cinnamon, has a strong odor and a sweet taste; prepared from the oil, it is destitute of sweetness. The waters distilled from German chamomile, origanum, marjoram, fennel-seed, Levant worm-seed, and cardamom, contain, besides acetic, also butyric and valerianic acids, some others propionic acid; rue-water contains the aldehyd of caprinic acid, and valerian water valerianic acid.

To obviate the rapid decomposition to which the medicated waters are subject, two methods have been proposed: 1. The vegetables are soaked for 24 hours, and then their own weight of water is distilled over, which, on use, is to be sufficiently diluted; 2. The vegetables are merely covered with water, and macerated for a day; for each ounce of distilled water, which they ought to yield by the Pharmacopœia, 5 grains of alcohol are added, and by distillation so many scruples are obtained as ounces are directed by the Pharmacopœia. This essence keeps much better than the distilled water, and any medicated water may be obtained by mixing one scruple of this essecne with 23 scruples of water.

Aqua amygd. amar. and aqua laurocerasi are to be kept in black 1 oz. vials sealed with wax; in a similar manner chlorine water is to be kept in black 1 oz. glass stopper vials, in a cool place; it will retain its strength for years, so that 1 oz. will entirely peroxidize 16 grains of protosulphate of iron.

4.—*Extracts.*

Nitrate of potassa, chloride of potassium, and other salts are frequently found crystallized in old aqueous extracts, which, with the constant access of air, are gradually more or less converted into apothegm and humus-like products; the decomposition may be partly prevented by covering their surface with sugar and adding a little alcohol. But such an extract may be compared to a rotten apple, the brown of which increases in size by concentric circles, until the whole of it has been converted into a brown rotten mass. When the aqueous extracts, however, immediately after their preparation, are filled into ½, 1 or 2 oz. wide-mouthed vials, these corked and treated by Appert's method, and lastly sealed, no process of decomposition will ever take place. This treatment is of course unnecessary for dry aqueous extracts.

Hydro-alcoholic extracts generally do not require such a treatment, which is advisable only in such cases where they absorb water from the atmosphere, like extractum belladonnæ, conii, hyoscyami, and ergotæ. Alcoholic and ethereal extracts likewise do not require this treatment; but it would do no harm and certainly prevent changes, unknown to us, which may take place in the course of years.

5.—*Tinctures.*

Tinct. rhei aquosa, filled in 1 oz. vials and treated by Appert's method, keeps unaltered; carbonate of soda produces a much finer color than carbonate of potassa. The alcoholic tinctures deposit precipitates; sometimes crystals, like tinct. assafœtidæ, castorei and scillæ. Tinct. capsici, after having been exposed to the sunlight (direct?) for eight years, had lost its color and acrimony; while tinct. colchici and colocynth. showed no such change. It is worthy of inquiry how the various liquid medicines will keep, in bottles of different colors, when exposed to diffused and direct sunlight.

6.—*Roots, Barks, Herbs, Flowers, Seeds.*

The advantage of double-cased tin vessels for the preservation of vegetables, is now generally admitted; when entirely dry they keep perfect in these vessels. Mullein flowers, after eight years, still had their golden yellow color; narcotic herbs, after four years, their peculiar odor and green appearance; burdock, colombo, chicory and elecampane, after five years, all their sensible properties, and no insects could be discovered.

Ergot and mustard flour assume, when kept in this manner, a musty odor; but such mustard was just as strong to the taste as before; and ergot, when treated with potassa, evolved a fishy odor not less faint than before. It appears, however, advisable not to keep too large a quantity of these powders on hand.

Vegetables may be kept in glass bottles, when they, in a well dried state, are treated by Appert's method. Violets, roses, primroses and many others are thus preserved in an excellent state.

By the experience of the pharmaceutist, Liebig's assertions are proved, namely: "That the tendency of organic matter in contact with air to pass into fermentation and decay, and in consequence thereof to start fermentation and decay in others, is suspended without exception by the temperature of boiling water; that if the first and sole cause of these changes—

oxygen—is now excluded, the vegetables must preserve their qualities for an unlimited time; that matter alone possesses no power of mobility, and that no atom alters its properties or changes its place save by an external influence."—*Wittstein's V. Schr.* ix. 340–349.—J. M. M.

ETHER AS A REMEDY FOR DEAFNESS.

The attention of the public, both medical and non-medical, has been of late attracted by a fact which, though in its origin and early phases going back some years, is of interest through the publicity given to it by the official journal of the University of Paris, as well as through the daily press.

To state the question briefly:—About the month of August, 1855, a certain Mademoiselle Cléret, a private governess, inhabiting a populous part of Paris, applied to the Minister of Public Instruction for assistance, basing her application, among other grounds, upon her knowledge of a method of causing the deaf and dumb to hear. This method, the discovery of which was accidental, and of which she had made a successful trial upon some pupils suffering from deafness, after having experienced its efficacy in her own person, consists in the use of sulphuric ether dropped directly into the external auditory canal at the rate of four, five, six, or eight drops per day. After the application of the remedy for fifteen or twenty days, its use may be suspended some days, and then renewed; it may be continued, if not indefinitely, at least for a very lengthened period.

A commission appointed by the Minister, and of which the medical element included M. Lélut as president, M. Béhier as secretary, and the late M. Bérard, was deputed to examine into the state of the children submitted to it by Mademoiselle Cléret. The commission pursued its investigation with the utmost diligence, until upon a sudden the lady was seized with a fearful malady. After having waited, without much hope, an improvement in the mental condition of Mademoiselle Cléret, the commission drew up its report, although the question, necessarily suspended, did not appear susceptible of being brought to a definite conclusion, or to a complete and demonstrative result. It considered, however, that it was its duty to make known such facts as it had witnessed; this it did in the following terms:—

Twenty-nine children have been treated by this lady; all with beneficial results. Two of those brought by her before the commission, and who had been treated by her previously, were completely cured. Seven children have been submitted to the commission previous to any trials being made upon them, and their absolute deafness and dumbness demonstrated by Mademoiselle Cléret; and in all cases, but especially in four, a manifest change has been perceptible after eight or nine months of treatment, and the patients have been able to recognize with great ease various sounds. The reporter to the commission has been careful to add that the most minute precautions were taken to avoid sources of error, and to guard against any illusion that might arise from perception derived through another sense than that of hearing.

The commission, wishing to test the means used by Mademoiselle Cléret upon other cases than those exclusively under her own care, deputed one of their number to carry out her plan of treatment upon other patients. Twenty persons were accordingly entrusted to him; most of them were deaf-mute children, but there were also some old men whose hearing was impaired—in some cases upon one side only. In all these a very noticeable effect was produced. It was also found that patients whose sense of hearing had become impaired through typhoid fever were very speedily restored by the same treatment.

In conclusion, the commission state that with the exception of two or three children whose deafness and dumbness was attested by authentic certificates, and who now hear well, it has determined nothing but the incomplete results of experiments commenced, but not terminated, manifest improvement, but nothing more definite.—*Lond. Pharm. Jour. Aug.* 1860, *from Gazette des Hopitaux*, 8th May, 1860.

DOUBLE SALTS OF IODIDE OF ANTIMONY.

The iodide of antimony forms beautiful double salts with the iodides of the alkaline metals, several of which are described by Schæffer. He obtains them by adding the iodide of antimony in fine powder to hot saturated solutions of the other iodides, and then slowly evaporating the solution at the ordinary temperature. He generally used three equivalents of the alkaline iodide to one equivalent of the iodide of antimony, and in contradiction to Nicklès asserts that the latter is never decomposed.

Iodide of Antimony and Potassium forms quadrangular plates with angles frequently truncated. They appear blackish brown by reflected, and red by transmitted, light. By heating to 100° for some time they lose all their water and are then of a beautiful vermillion color. The composition of the salt answers to the formula:—

$$3KI, 2Sb\,I_3+6HO.$$

Iodide of Antimony and Sodium forms rectangular prisms of an orange yellow color. Anhydrous the salt is orange. Formula: $3NaI, 2SbI_3+24HO$.

Iodide of Antimony and Ammonium. A hot saturated solution of one equivalent of iodide of antimony and three equivaents of hydriodate of ammonia deposits successively three different salts: the first $3NH_4I,4SbI_3+18HO$ forms rectangular prisms of a scarlet red color. When dried it becomes crimson red. The second $3NH_4I,2SbI_3+6HO$ a good deal resembles the potash salt described above. The third, $4NH_4I,SbI_3+6HO$ presents itself in large rectangular prisms with pointed edges, almost black, but ruby red when seen by transmitted light through the thin parts: when dried it becomes of a carmine color.

Iodide of Antimony and Barium. Translucid rhomboidal prisms of a deep orange color, and of a glassy lustre. Formula: $2BaI,SbI_3+18HO$.

Water decomposes all the above salts with the deposit of the basic iodide of antimony. Hydrochloric, acetic, and tartaric acids dissolved them. Sulphide of carbon removes the iodide of antimony from them. Heat decomposes those with a fixed iodide base, giving a sublimate of iodide of antimony; the ammoniacal salts sublimate with partial decomposition.—*Chemical News, London, Sept.* 1, 1860, *from Pogg. Annal. der Phys. u. Chem.* Bd. cix. s. 611.

ANALYSIS OF BEEF MARROW.

By Dr. C. Eylerts.

Until now, we possess only two investigations of the marrow fat of the ox. The older is by Berzelius, (Gehlen's Journ.

1806, ii.) and treats chiefly of its general properties; Jahn (Chem. Tab. 1814) merely gives a short note, that it was apparently composed of two fats,—one of which was liquid, and could be separated from the solid by filtration. According to Berzelius, ox marrow fuses at 45° C., is saponifiable by alkalies, slightly soluble in boiling alcohol, separating on cooling as a white flocculent powder, and, with difficulty, soluble in ether; he likewise subjected it to dry distillation, and to the action of sulphuric and nitric acids.

Dr. Eylerts prepared the pure fat from the marrow, which was of a yellowish white color, inodorous, of a mild taste, and, after four months, showed no disposition to rancidity. It was drawn into a capillary tube, having some air between the several drops, and fused then at 45·°5 C. (113·°9 F.), and congealed at 35° C. (95° F.) It is soluble at 12° C. in 42 p. ether of ·730 sp. gr. in 2420 p. alcohol of 90 per ct., and in 40 p. oil of turpentine. Boiling ether and oil of turpentine dissolve nearly their own weight, boiling alcohol 1-150th.

In order to determine the fatty acids, the marrow fat was saponified with potassa and the soap decomposed with diluted sulphuric acid. The mother liquor contained no volatile acid; but yielded, by evaporation and treating with alcohol, almost 4 per ct. of syrupy sweet glycerine.

The fatty acids were fused with water and combined with potassa; the soap was decomposed by chloride of sodium, and the amount of magnesia determined necessary for the complete precipitation. One hundred and twenty grs. of soda soap yielded 234 grs. (?) of magnesia soap, which contained 5·85 grs. of magnesia.

Six oz. of the soap was now dissolved in 60 oz. of 86 per ct. alcohol and precipitated with one-fourth the requisite quantity of acetate of magnesia dissolved in alcohol; this fractional precipitation was repeated twice after the separation of the precipitate.

Each of the precipitates was fused with dilute hydrochloric acid until all the magnesia had been removed; the fat was freed from the acid, and dissolved in hot alcohol, from which a portion separated, after cooling, in loose crystalline laminæ. This crystalline precipitate was repeatedly treated with hot alcohol until the fusing point was stationary; it now fused at 72·°5 C. (162·°5 F.), and congealed at 67° C. (152° F.) Ultimate analysis proved it to have the composition $C_{42}H_{42}O_4$. The author named it *Medullic Acid.* Vœlcker's acid from the behenoil (from the Moringa oleifera), for which he gives the same composition, fuses at 76° C., and Strecker has already remarked that the analyses agree better with the formula $C_{44}H_{44}O_4$, which is rendered probable by the fusing point of the medullic acid.

From the mother liquors obtained from the re-crystallization of the medullic acid $\frac{7}{8}$ of the alcohol was distilled off. The crystalline mass was repeatedly crystallized from alcohol, and fused then at 62°C. (143.°6 F.) and then congealed at 55°·5 C. 131·°9 F.); it was *palmitic acid.* The mother liquors yielded a small portion of a mixture of palmitic and oleic acid, fusing at 38° C.

The filtrate from the third precipitate with acetate of magnesia was mixed with the remaining fourth of the alcoholic solution of this salt, and evaporated with the addition of water. The magnesia soap was decomposed by hydrochloric acid, the fatty acid combined with potassa, the soap decomposed by chloride of sodium, and the resulting soda soap precipitated by acetate of lead. Ether dissolved from it 87½ per ct. and 5·875 grs. of this soluble portion left on incineration 1·710 and 1·720 grs. PbO; the formula PbO, $C_{36}H_{33}O_3$, requires 1.7047 grs. The acid of this soap is therefore *oleic acid.*

No stearic acid was found.

The approximate proportion of the three acids in ox marrow is: palmitic 46, medullic 10, and oleic acid 44 per ct.—*Inaugural Dissertation, Wittstein's V. Leh.* ix. 330–340.—J. M. M.

ON A PURE NATURAL WATER.

By B. M. Brackenridge, of Tarentum, Allegheny County, Pa.

Spring water usually contains a larger or smaller amount of gaseous and saline bodies in solution; rain water is generally supposed to approach nearest to distilled water. The author, however, gives notice of an exception to this rule, and Dr. Ewd. Stieren, who has been using the water since 1852, confirms his statement.

The spring in question appears on the highest point of a narrow ravine, known as "The Dark Hollow," in the hills forming the boundary of Allegheny county. A layer of kies and sand, from 50 to 60 feet in height, rests upon slate rock, which is impenetrable for water. The water filters through the kies and sand, and rushes from between the rock and the sandy stratum in a constant stream,—collecting in a small basin, and falls over the slate rock about 25 feet into another basin.

After heavy rains the spring water contains a trace of carbonic acid, which, however, is lost in falling over the precipice, and the water below the falls is always chemically pure. Blue and red litmus paper is not altered by it; nitrate of silver and chloride of barium occasion no turbidity; and the vapors of the water, when conducted into a solution of nitrate of baryta, rendered alkaline by ammonia, do not disturb the same; boiled with solution of indigo, no discolorization takes place; five gallons of it, when evaporated, left no solid residue.

In answer to the lecture of a Mr. Clemson, before the Smithsonian Institution, in Washington, D. C., which was published in the National Intelligencer, the author wrote a paper, to which Mr. Clemson replied, that it could not be chemically pure; but must contain oxygen from the atmosphere. But, inasmuch as the author did not state the spring to be a hot one, and as cold distilled water absorbs air when left in contact with it, the author has proved it to be as pure as cold distilled water. All his reagents are dissolved in this water, and he never observed any alteration in these solutions.—*Wittstein's V. Lehr.* ix. 370–373.—J. M. M.

Varieties.

Pennsylvania Rock Oil.—In most countries, a troublesome process must be undergone to extract oil from mineral substances, such as from coal and asphalt; but Pennsylvania seems to be so favorably dealt with by Dame Nature that the very rocks distil oil into her lap. The north-western part of that State seems to contain a number of subterranean springs which yield a limpid oil, some of which we have examined. It appears that the Pennsylvania Rock Oil Company purchased the spring of Brewer, William & Co., for the sum of 5000 dollars; and, in 1858, leased it to Mr. E. L.

Drake, with the understanding that he should gather the oil at his own expense and pay them 12½ cents a gallon for it. His lease extended for 15 years, with full privilege of working it at his own option. In May last, he commenced looking for salt, and after sinking a shaft 71 feet, on the first of last month, he struck a fissure through which he was boring, and the discovery of the subterranean spring of oil was the result. The yield per day, up to the period of the recent fire, had increased from 400 to 1600 gallons. The tract of land on which this spring is located was once purchased for a cow, and previously it had been sold at the treasurer's sale for taxes. Now, it is believed, 100,000 dollars would not purchase one acre of it.

The substance known here as Seneca oil, exudes from the rocks, or floats on the surface of springs, in various parts of the world. The name of Seneca oil was derived from the Seneca Indians, a tribe famous in the confederacy known as the Six Nations. The oil in this county was discovered and used by this tribe. A similar oil is found in abundance at Amiano, in Italy; Birmah, on the borders of the Caspian Sea; on the West India Islands; along the shore of the Kanawha, Virginia: in Kentucky; near Seneca Lake, New York; in western Pennsylvania, generally; and in great abundance in Venango county. The wells of Birmah yield 400,000 hogsheads annually. Its uses are almost endless. As a medicine, it is used both externally and internally; is regarded as an excellent stimulating embrocation in chilblains, chronic rheumatism, affections of the joints, paralysis, and kindred complaints. It is an ingredient in the celebrated British oil. It is also used for making an excellent lamp oil, known as Carbon oil, and is considered among machinists as the best lubricator extant.—*Chem. News, Jan.* 28, 1860, *from Scientific American.*

Autumn on the Thames.—No gardens of ancient or modern times can compare with the Royal Botanic Gardens at Kew for the innumerable variety and number of foreign plants, rare and majestic native trees and exotic ferns, thriving in health and marvellous beauty within its ample domain. To the young artist and artificial florist desirous of making progress in their calling, the months of September and October offer a favorable opportunity for the study of foliage in all its endless variety of form, size, and hue; the lover of nature, too, in one of her most beautiful aspects, and the admirer of gorgeous coloring, may also, at this season of the year, enjoy a treat of the very highest order, as the old and new arboretums, the pinetum, and many of the conservatories are brilliant with a thousand exquisite tints, the whole forming a series of sylvan pictures, rich with excess of beauty, forcibly reminding visitors of the departing glories of ancient Sherwood and the grandeur and magnificence of American primeval forest scenery during the fall of the leaf, or Indian summer, of that vast continent. Standing on the western terrace of the great tropical Palm-house, gilded by the setting sunbeams of a fine autumnal cloudless sky, the matchless view, embracing the whole of the extensive amphitheatre, inclosing the new arboretum with its floral temples, groups of patriarchal elms, lofty pines, stately oaks, spreading cedars, woodland glades, and noble avenues, bounded by the calm, flowing river, which seen at high water from an eminence (Victoria Mount,) has the appearance of an extensive serpentine lake—the stream, reflecting the bright azure of the lovely sky, realizes the idea of a splendid sheet of lapis lazuli, or an immense turquoise, enwreathed with emeralds, variegated with the most costly gems—is beautiful and picturesque almost beyond the power of language to depict; no written description can convey to the reader its enchanting loveliness and surpassing beauty; the prospect, from its magnitude, loneliness and solitude, approaches sublimity—it must be seen to be enjoyed and appreciated. This glorious and perfect panorama is universally allowed by competent judges to be unrivalled as a specimen of English landscape gardening and river scenery throughout the world.—*Athenæum.*

Preparation of Carbonic Acid.—Messrs. Meschelynck and Lionnet have devised a means of preparing large quantities of carbonic acid from carbonate of lime, at a comparatively nominal cost. The operation consists in passing the vapor of water over carbonate of lime. It is well known that chalk undergoes decomposition at a moderately high temperature, and that the change is much promoted by the presence of steam; but the authors indicate that if the chalk be subjected at 100° to a current of steam, the whole of the carbonic acid is disengaged with sufficient rapidity to render the process a convenient one for use upon the large scale.

The authors recommend the following mode of operating:—Refractory earthen retorts, filled with chalk, are heated to dull redness in a reverberatory furnace. Currents of steam are then passed through the retorts, when large quantities of carbonic acid are immediately evolved.—*Lond. Pharm. Journ. Oct.* 1860.

Detection of the Adulteration of Citric with Tartaric Acid.—The similitude of the physical characters of those acids, when the crystals are bruised, permits of this adulteration in commerce. It is easily detected by pouring over a horizontal glass plate a thin layer of a slightly saturated solution of caustic potass, and then projecting on this a portion of the mixture of doubtful crystals. In a few seconds the tartaric acid crystals whiten, become opaque, being covered with microscopical crystals of bitartrate of potassa. The citric acid crystals continue diaphanous, being partly dissolved in the alkaline solution. The relative quantities of the two acids may thus be easily appreciated. The same means may be applied to a powder formed by exactly mixing the two acids. The object-glass of a microscope being wetted with the solution is then powdered with some of the suspected substance. A crowd of minute acicular crystals is produced from the tartaric acid, while the diaphanous citric acid disappears in the solution.—*London Pharm. Journ. from Bulletin de Therap.*

Minutes of the Philadelphia College of Pharmacy.

The Semi-Annual Meeting was held at the College Hall, 9th mo. 24th, 1860. Present, 23 members. The President, Charles Ellis, in the Chair.

The minutes of the Annual Meeting and those of the Board of Trustees for the last six months were read.

Thomas A. Lancaster has been elected a Resident Member of the College by the Board. The degree of Graduate in Pharmacy was conferred, after the midsummer examination, upon

James H. McKee, thesis on Ergota, and
Lewis Levy, thesis on Juglans Cinerea.

The following Report was read and accepted :

" The Delegates elected in March last, to attend the Ninth Annual Meeting of the American Pharmaceutical Association, respectfully report, that, on learning of the inability of William H. Squire and W. J. Jenks, to be present at that meeting, they elected James T. Shinn and Geo. J. Scattergood to fill these vacancies.

The meeting of the American Pharmaceutical Association took place in the University Buildings, on Washington Square, in the city of New York. It commenced on Tuesday, September 11th, and continued till Friday, the 14th. Besides the whole delegation, and 13 other members of the College of this city, delegates from the Pharmaceutical Colleges at Boston, New York, Baltimore and Cincinnati were present. The Eastern and Middle States were represented by many members, and from the South and West a small number were in attendance.

Many papers, strictly scientific, or intimately connected with the welfare of the pharmaceutist, were read, and testified to an increasing interest in the Association. Some important questions, such as the legal restrictions on the sale of poisons, the proposed change in weights and measures in the next edition of our national Pharmacopœia, the closing of drug stores during a part of every Sunday, &c., elicited spirited discussions. Among the specimens on exhibition, many apparatus and chemical and pharmaceutical preparations were of Philadelphia manufacture.

It is expected that the Proceedings of this meeting will shortly appear in print ; they will make a volume which, in point of interest, will not be behind those previously published.

We would further remark, that the druggists and pharmaceutists of

New York gave a splendid dinner to the members of the American Pharmaceutical Association and a number of invited guests.

As a matter of particular interest, we may notice the invitation extended by Dr. E. R. Squibb to visit his laboratory. Many members availed themselves of this opportunity, and were gratified by the examination of the many improvements adopted by our enterprising fellow-member.

The next meeting of the American Pharmaceutical Association will be held in St. Louis, Mo., on the fourth Wednesday of August, 1861. A committee has been appointed with the view of organizing an excursion party from the Eastern and Northern States, and of securing a large attendance of the Pharmaceutists and druggists of the South, the West, and the Southwest, at the Tenth Annual Meeting.

Signed, JNO. M. MAISCH,
CHARLES SHIVERS,
WM. R. WARNER,
JAMES T. SHINN,
GEO. J. SCATTERGOOD,
Delegates."

The following Report was read by J. M. Maisch, Chairman of the Committee from which it emanated:

"The Committee on the collection of Plants, appointed at the Annual Meeting in March, respectfully beg leave to submit the following report:

From the beginning of April to the end of August, we have devoted at least one, sometimes two or three, afternoons every week to the gathering of plants, which were dried in the usual manner. By spending so much time for carrying out the purposes for which the Committee had been appointed, and by directing our excursions to various parts of the country surrounding us, we have been enabled to make quite an extensive collection of the plants growing in our neighborhood. We have not found the time yet to systematically arrange these, and are, for this reason, unable to lay a complete list before the College. We intend to continue our excursions until the close of the season.

The object of appointing this Committee was, with the view of meeting the proposed exchanges with the Swiss Apothecaries' Association, to effect which, however, no authority was granted them. The Committee would, therefore, respectfully ask for the authority to send to and receive plants from Dr. Flückiger, the President of the Swiss Association, in the name of the Philadelphia College of Pharmacy.

The Committee have examined the Herbarium of the College, and offer the following remarks:

There are now two collections, besides some loose specimens, stored away in the closets of the College. Both contain but few cryptogamous plants, and for neither of them has a catalogue been made out. From a hasty examination of one, we found that, although it was arranged somewhat in natural orders, it embraced many plants not yet analyzed. The Committee have as yet done very little with it.

The other collection is, on the whole, in an excellent condition, all the plants having been analyzed, with few exceptions, and arranged systematically into orders, sub-orders and genera. We concluded to write out a full catalogue, which is now upon the table, and subsequently to arrange into this herbarium the plants of the other and of our own collection.

In attending to this assumed duty, we observed that a large number of the plants were of foreign growth; from England, France, Spain, Italy. Switzerland, Germany, Russia, Turkey, Greece, Egypt, Asia Minor, the Caucasus, Persia, China, &c., and that most of them had been well dried and preserved. There is a deficiency in good specimens of American plants, though many genera have evidently received much attention; and plants indigenous to the South and to the West have been procured.

In this collection the College possess a very good foundation for a first-class herbarium, and it appears to your Committee to be a duty of the College to improve it as much as possible, so as to impart a stimulus to the important science of Botany, which is still too much neglected by our pharmaceutists generally.

Considering these facts, the Committee venture on the following propositions:

1. We propose to create a standing Committee on Botany, whose duties shall be to collect plants, keep the herbarium in order, and place it in a condition which will admit of its being used in lectures on botany, materia medica, pharmacy, &c.; to effect exchanges, and enter into correspondence with individuals, societies and colleges, of our own and of foreign countries.

This committee should consist of not less than five members, who are willing to devote, faithfully, a portion of their leisure hours to its purposes.

2. We propose that a good microscope be procured, either out of the funds of the College or by private subscription.

The College is probably in need of such an instrument for other purposes; this Committee have sadly felt the need of it. Acotyledonous plants, umbelliferæ, cruciferæ, compositæ, gramineæ, juncaceæ, &c., had to be more or less neglected this year, the magnifying glasses in possession of your Committee being insufficient, in many instances, to recognize minute distinguishing characteristics.

3. We propose that some new works on the botany of the United States and some foreign countries be procured.

In analyzing plants, it is indispensable to compare the views of different authors, likewise to consult authorities of foreign countries with a climate similar to our own. We consider the botanical works of our library not sufficient for the purpose of a committee on botany.

4. We propose to have a good specimen of every species and its varieties mounted on paper, systematically arranged and kept, so as to be always ready for examination.

Our idea is to have the whole herbarium preserved in a similar manner to the specimens presented by Professor Thomas, and to keep them in cases like those upon the table. When put up in this manner, the plants will be less liable to injury, their value for the purposes of the College will be greatly enhanced, and the herbarium assume its proper importance among the other valuable collections of the College. Sections of different organs, where they are important, and notes on the habitat, the time of flowering, the synonyms in Latin and English, and, probably, in other modern languages; the names of plants which are used as adulterations, or with which they might be comfounded; this, and probably other information might be added, whereby the usefulness of the collection would be increased manyfold.

We are aware that this work would be an undertaking occupying many years to come; but we sincerely believe that it will result in a vast benefit to our institution.

To aid the Professors in their lectures on the various branches taught in the College, we are of the opinion that a separate collection ought to be made of such plants as have been, or are at present, officinal in our Pharmacopœia, or products of which are employed in medicine; and we, therefore,

5. Propose, that a *collectio plantarum officinarum* be prepared by the Committee on Botany, the plants to be mounted in a similar manner as before indicated.

All of which is respectfully submitted.

Jno. M. Maisch, *Chairman.*
Wm. R. Warner,
On behalf of the Committee.

Philadelphia, Sept. 24th, 1860."

The reading of this report called forth a general expression of satisfaction with the zeal and efficiency of this Committee; on motion, it was accepted, and the Committee continued for the next six months. Professor Procter was released from the service at his own request.

On motion, it was resolved that the Committee be authorized to enter into the correspondence and make the exchanges mentioned in their report.

On motion, it was resolved, That the Board of Trustees are instructed to procure a microscope, as suggested by the Committee, and to aid them in carrying out the proposals of the Report as far as practicable.

The following proposal for a new law of the College was submitted by James T. Shinn and A. B. Taylor, and on motion directed to lie on the table till the next meeting, as required by the laws:

"Law X. of the Herbarium.—A standing committee of five shall be appointed by the College at the meeting in September, to keep the Herbarium in order, to collect plants, to place them in condition to be used in lectures on Botany, Materia Medica, Pharmacy, &c.; to effect exchanges, and to enter into correspondence with individuals, societies and colleges, of our own and foreign countries."

The Corresponding Secretary, in reply to a letter addressed to the Swiss Apothecaries' Association, by order of the Board of Trustees, introduced the following letter received by him in reply, which was directed to be noted on the Minutes:

Der Schweizerische Apothekerverein, BERNE, Sept. 1st, 1860.

To Mr. William Procter, Jr.,
Corresponding Secretary of the Philadelphia College of Pharmacy.

DEAR SIR: I have well received the letter which you addressed on Feb. 26th, past, to Mr. Ringk, our Vice President, and return you the best thanks for your kind offers.

As to the specimens desired, we only understand such plants growing in the territory of the United States—both spontaneous and cultivated—being actually or formerly of any use in medicine, industry, or furnishing any interesting goods for trade or kitchen; also, plants distinguished by poisonous qualities. Drugs of this order, furnished by these plants, or others, should be added if possible. Botanical and other scientific and practical notices on the specimens sent, would be very agreeable. Plants notoriously immigrated from Europe are to be excluded, unless they present some interesting particularities (degeneration). We shall be very glad, if it be possible to join, perhaps, some specimens from other parts of America, especially from Mexico, the West Indies, or the northern parts of South and Central America.

I scarcely need to call by name the plants I understand by the above definition; it may be sufficient to point out, for instance :—

Quercus tinctoria, Michaux ; Abies balsamea, D. C.; Abies canadensis, Link ; Pinus palustris, Aiton ; P. Tæda, L.; Sassafras offic.; Monarda didyma, Monarda fistulosa, and other Monardas ; Adiantum pedatum, L. (Ad. patens, Wild.) ; Spigelia marilandica, L.; Smilax China, L.; Lobelia inflata, L. syphilitica, (root) ; Polygala Senega ; Aristolochia serpentaria ; Diervilla canadensis ; Gaultheria procumbens ; Tillandsia usneoides ; Chenopodium ambrosioides; Carya (Juglans) olivæformis (Hickory); Mentha piperita and others ; Saccharum ; Gossypium ; Nicotiana.

From the plants of foreign countries I only name, for instance :

Maranta, Croton Eleuteria, Cinchona, Geoffroya Surinamensis, Picræna (quassia) amara and excelsa, Quassia Simaruba, Erythroxylon Coca, Paullinia sorbilis, Hæmatoxylon, Smilax medica, Smilax officinalis and others ; Convolvulus Purga and C. Orizabensis, Cephaeilis Ipecacuanha. Convolvulus Mechoacana, Hymenæa, Pterocarpus Draco, Hibiscus Abelmoschus, Myrtus Pimenta, Anacardium occidentale, Veratrum Sabadilla, (Sabadilla off. Brandt,) Guaiacum, &c. Merchandizes generally known (Sassafras, rad. Senegæ, Ipecacuanha, Jalapa, lig. Guaiac,) may not be sent.

I think, finally, it would be very well to present me a list of specimens which you are able to send, before taking the trouble of composing really the collection, in order to simplify the choice, and to avoid useless care.

The collection may be sent to the Smithsonian Institution, Washington, to be directed to Mr. Flugel, Consul of the U. S. at Leipzig, together with the books which the Smithsonian Institution presents from time to time to the Swiss Association of Natural Sciences.

I am ready, for my part, to send you any Swiss plants, medical or others, which you will make known, or drugs, minerals, &c.

I beg you to present to the next meeting of the American Pharmaceutical Association the best thanks of their Swiss colleagues, who receive with great pleasure your communications. Best regards, also, to Mr. Maisch.

With the assurance of true respect,

I am, truly yours,

FLÜKIGER, Dr.,

President of the Apothecaries' Association of Switzerland, Apothecary of the State of Berne.

The Committee on Latin Labels informed the College that they have in press a new and greatly extended book of specimen labels, including the names of articles of Materia Medica, Pharmaceutical preparations, and chemicals used in analysis and for illustration, the whole being intended for use in cabinets of specimens.

The Semi-Annual election for eight members of the Board of Trustees was held, and resulted as follows :

Thomas P. James,	Jacob L. Smith,	Wm. J. Jenks,
A. B. Taylor,	C. Bullock,	Evan T. Ellis,
Dr. W. H. Pile,	James T. Shinn.	

To fill a vacancy occurring through inadvertence at the last election, John M. Maisch.

The following were elected the Committee on Deceased Members:

Edward Parrish, W. Procter, Jr., C. Bullock.

Then adjourned.

Edward Parrish, *Secretary.*

Editorial Department.

Meeting of the American Pharmaceutical Association.—At the appointed time, the convention of this now large body met at the University buildings, in New York, and transacted the various business which pertains to its mission in the cause of Pharmacy. The Minutes of the Meeting, which we publish in the beginning of this number, will show what that business was in detail. Harmony continued throughout, and not the slightest ripple of ill feeling was manifested in any of the discussions, a result not always to be claimed by such meetings. About eighty new members joined the Association at this meeting, which now swells the aggregate number to five hundred and thirty five. Besides the reading of scientific papers and reports, the subjects of the sale of poisons, of weights and measures, and of the adulteration of alcoholic liquors, were discussed at some length. The discussion on weights and measures was unfortunately left till the last day, when very many of the members had left for their homes. As it was, the expression was entirely against the adoption of the plan proposed for the British Pharmacopœia, which is to abandon Troy weight in toto, and divide the avoirdupois ounce into the apothecary's weight divisions, making a new grain the 480th part of 437·5 grains. The adoption of the resolution of Dr. Squibb, to use the term *parts* in lieu of weights—meaning parts by weight—we consider as highly objectionable for the Pharmacopœia, involving a mental process on every occasion, which, in the hands of the unskilled, will be constantly liable to lead to error and confusion. It suits the chemical laboratory very well, where the variations in quantities operated on is constant with the demand.

In its literary and scientific results, we believe that the New York meeting falls behind those of Washington and Boston, a result partly owing to there being few important special committees; but mainly to the large proportion of failures to answer the queries accepted last year. As this labor is entirely gratuitous, it is liable to great irregularity in its performance; and, whilst regretting the falling off in this particular at this meeting, we may hope for a more abundant harvest at St. Louis next year.

Notwithstanding the deprecatory resolution of last year, our New York friends could not see the propriety of denying themselves the indulgence of a gastronomic display, and in accordance with the liberal way in which such things are done in "the metropolis," the dinner given by "the Druggists and Pharmaceutists of New York," to the members of the American Pharmaceutical Association, is said to have been the most extensive and costly affair of the kind that has yet attended the progress of our Body. Although an invited guest, we were not present, being, as our friends know, opposed to such demonstrations, and, therefore, better absent. It is a thoroughly Anglo-Saxon custom—that of eating and drinking an association into popularity and notoriety—and we see but little hope of any change in a custom that seems as natural to the Anglo-American, as if an indigenous production. But whilst bearing testimony against this speciality, we are not disposed to find fault with those who see in these occasions opportunities for the culture of friendly and business relations, and the initiation of friendships which bear good fruits; it is more the manner than the thing—the accompaniments than the thing itself: and when stripped of vinic demonstrations and alcoholic effusions, "annual dinners," if kept within the bounds of moderation, with less show and more substance, may really be the means of promoting friendship and good fellowship among the members; and to prove that we harbor no ill feeling against our New York friends, we give below the introductory speech of our worthy ex-president, John Meakim, who was chairman on the occasion.

Gentlemen of the American Pharmaceutical Association:

The character of his studies and the nature of his duties, have a great tendency to seclude the Pharmaceutist from the social festivities of his fellow-men; and such is the effect of habit upon the mind, that his becomes imbued, almost, with the idea of a positive necessity for such seclusion. Growing out of this state of feeling, a portion of our respected associates are averse to any allotment of time for the social discussion of subjects not directly identified with Pharmacy. But surely one evening of the year is not too prodigal an allotment, in which we may cast aside the daily thoughts and cares of our vocation to meet our brethren at the social board for an interchange of kindly sentiments. And what more fitting season than this, when the votaries to Pharmacy assemble from the snow-capped north and the sunny south, from the thriving east and the fertile west, with their annual gatherings of useful thoughts and facts, as contributions to the store of knowledge in our Association, and which tend to bind us and our glorious Union to a common cause. For, truly, as Pharmaceutists, we have no division between North and South. However, gentlemen, entertaining a high regard for respected minorities, we have endeavored that our social intercourse on this occasion shall partake of a spirit of investigation, and with that view we would invite your attention to an examination into the science of Gastronomy; in its relations to the Hygienic art, with which that of Pharmacy is so closely connected. The culture of the grape, and the production of native wines, are also eliciting a general interest; and are, especially appropriate for your earnest and serious consideration at this time. We submit for comparison, samples of foreign and native, said to be strictly pure and for medicinal use only. And it is our hope, gentlemen, to use the language of an early and zealous friend of the Association, "that each will prove to be good of its kind;" and also that when we come to a final vote on them we shall be able to *rise* to a man in the affirmative.

With these views, fellow-members and honored guests, we have invited you to partake with us of this social repast. I am proud, as the vocal organ of my colleagues, the Druggists and Pharmaceutists of New York, to bid you welcome, and to assure you of our desire to make this an hour of pleasure and of profit to you. Accept, then, gentlemen, our thanks for the honor of your presence.

I will not refer to the growth of our Association, and its increasing usefulness; these are better attested by the presence of its members, and by the value of their contributions, than by any language of mine; and I have the less regret for this deficiency on my part, as I feel assured that ample recompense will be made by an associate, who will respond to the first sentiment of the evening.

The President then read as the first toast:—

The American Pharmaceutical Association—its migrations and gathering forces—from the sturdy North to the genial South—from the historical East to the young and glorious West—from Mount Vernon to Bunker Hill, and thence back to the point of beginning. May the vigor of its past course be the earnest of its future.

The toast was responded to by Dr. Guthrie, who gave a succinct history of the origin of the Association, a theme grateful to him as one of the chief actors at its inception.

OUR JOURNAL.—The present number, which completes the thirty-second volume of this Journal, (which has been issued without intermission during as many years,) has been delayed beyond the usual time of issue, by the Index and the additional duties of the Editor, in connection with the Proceedings of the Association, which, it is hoped, will be accepted as a sufficient apology for our lack of punctuality. In the next volume we propose to publish, in parts, a translation of the work of Dr. Rochleder, on the proximate analysis of organic substances, with notes by Mr. John M. Maisch, and which will prove a useful work of reference and study to our young pharmaceutical chemists, who wish to prosecute organic research in a regularly scientific manner.

IS CITRIC ACID A POISON?—Some of our readers have taken exception to the paper of Dr. J. Lawrence Smith, published in our last number, on Tartro-Citric Lemonade, from the employment of what is believed to be a species of sophistry, which tends to discredit a well-tried and valuable preparation. As we have been reflected upon for not pointing out this false argument at the time of publishing the paper, (which we really had intended to do in a foot note, but forgot it at the right moment,) we do so now. The sophistry consists in throwing the onus, which appertains only to a concentrated solution of citric acid as a corrosive gastric irritant, on solution of citrate of magnesia, because sometimes this solution has quite an excess of acid present, and thus causing the unwary reader to infer, because Bence Jones found citric acid *per se*, poisonous to rabbits, etc., *ergo* citric acid is poisonous to man—consequently citrate of magnesia must be objectionable;—and this, in despite the facts that the medical journals have been recommending rheumatic patients to be drenched with lemon-juice by the half pint, and that lemonade is universally considered a healthful beverage.

SUNDAY CLOSING MOVEMENT.—Since our last issue, the Apothecaries of Philadelphia met at the Hall of the College of Pharmacy, and decided on adopting a new arrangement of the time of closing stores on Sunday, so as to meet the wants of the public better than that first tried. The following communication will show the present arrangement:

The Sunday Movement among the Apothecaries.

It is well known that a movement was inaugurated last summer with a view to securing to the Proprietors and Assistants of Drug Stores, a suitable period of recreation on the Sabbath. A paper was circulated for signatures among the druggists, pledging the signers to conform to such hours as might be agreed upon at a meeting to be held agreeably to notice. The signatures of a large majority of the Pharmaceutists and retail Druggists being obtained, a meeting was held, and, after full discussion, certain hours for opening and closing were fixed upon, an address was issued to Physicians and the public, and the arrangement fairly put to the test. From the first it became apparent that some of those who had subscribed to the paper, and then pledged themselves to the scheme, had no serious intention of changing their customary business arrangements on Sunday; these being among the most conspicuous Pharmaceutists of the city, weakened the resolution of others; added to this defection, was the fact which soon became apparent, that the hours fixed by the meeting were ill-advised, and constituted too radical a change from the long established custom. A meeting was therefore held on the 22nd of August last, at which it was resolved to canvass the whole city, except the three rural wards, and ascertain clearly the sentiment of the entire body of retail Druggists.

Accordingly, 238 were called on, of whom 187 were willing to conform to the following hours: *To open the stores on Sunday, except from* 1 *to* 6 *o'clock in the afternoon*, during which hours, and the latter part of the evening, they would close, and feel at liberty to absent themselves; 51 announce themselves as unwilling to conform to the arrangement. After a full discussion, it was at a subsequent meeting unanimously resolved to adopt the said arrangement. Committees were appointed to have it fully announced, and to correspond also with the medical organizations in regard to it. By order of the Committee.

We believe this plan to be practicable, after physicians and the people get accustomed to it and use a little forethought, providing needful medicines in the forepart of the day.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The attention of the members of this Body is invited to the following notice of its Executive Committee:

NOTICE.

To the Members of the American Pharmaceutical Association.

All those members who reside out of the cities of Boston, New York, Philadelphia, Baltimore, Cincinnati and St. Louis, who are entitled to the volume of Proceedings, by having paid their annual contribution, will please to enclose a printed card or clearly written address to the *undersigned*, that the books may be mailed as early and safely as practicable. In the cities mentioned, members will apply to Charles T. Carney, 138 Washington street, Boston; Henry Haviland, 23 John street, New York; Wm. Procter, Jr., Philad'a; William S. Thompson, Baltimore street, Baltimore; W. J. M. Gordon, Cincinnati, and Eugene L. Massot, of St. Louis. Those members who have not paid their contributions to the Treasurer, Henry Haviland, 23 John street, New York, are requested to do so early to meet the expenses of publication.

The undersigned also takes this opportunity to say that all those Pharmaceutists and Druggists who are eligible by the Constitution, who desire to become members *before* or *at* the annual meeting of 1861, at St. Louis, are requested to apply to the undersigned, and receive a blank Constitution for signature, and testimony, as preferable to postponing the application until the meeting convenes.

William Procter, Jr.,
Chairman of Executive Committee,
500 South 9th St., Philada.

Oct. 25*th*, 1860.

Poisonous Hair Dyes.—Prof. Aikin sends us (as below) the address of the Physician who was called upon in the case (noticed in our July No.) of the death of a child from the careless use of a hair dye. Our Woodville, Miss., friend can learn all the particulars he desires by addressing his inquiries to M. K. Baldwin, M. D., Mt. Gilead, P. O., Loudon Co., Va.

Proceedings of the American Pharmaceutical Association, at the Ninth Annual Meeting, held in the city of New York, September 11–15, 1860, *with the Constitution and Roll of Members.* Philadelphia: printed for the Association by Merrihew & Thompson; pp. 296, octavo.

In glancing over this volume, we find the first sixty-four pages of the text devoted to the Minutes of the meeting held in New York in September last. The report of this meeting, through the aid of stenography, is much more complete than usual, and the Minutes of the Secretary have been interpersed with the reports of the discussions, so as to add much to the interest of their persual. The discussion on the sale of poisons was partaken in by several members of the New-York Academy of Medicine, who were present by invitation.

The Report of the Committee on the Progress of Pharmacy, by Edward Parrish, Chairman, is a very bulky document,—occuping sixty-five pages. It commences with a brief notice of the several pharmaceutical organizations in the United States, of professional appointments, of necrological notices, of pharmaceutical literature, including catalogues of recent publications, and of general remarks on the drug market. The main body of the Report is occupied with brief references to papers in the European and American journals of the past year, on materia medica, pharmacy, inorganic and organic chemistry, and toxicology. The editor has added greatly to the practical value of this report by appending to the volume a special index of the authors and subjects of this Report.

The Report on Home Adulterations, by Charles T. Carney, the Chairman of the Committee on that subject, occupies about fifteen pages, and is chiefly devoted to the adulterations of food,—the Committee deeming such as within their province. The subjects of drinking-water, milk, yeast powders, and vinous liquors, chiefly occupy the Report, which speaks strongly against the use of lead pipes for water conduits into dwellings.

About twenty original papers follow these Reports,—most of them practical in their character. Three of these papers will be found in this present number, and will convey an idea of the general cast of the remainder. The longest paper is that of Dr. Donnelly on Cacao, of which substance the history, botanical and economical, are given, and it is illustrated with a very well executed lithographic figure of the plant and fruit. Dr. D. proposes, in another paper, to complete the subject by giving the full history of its manufacture and uses in medicine and dietetics.

The paper of Dr. Squibb, on Ethereal Oil, gives his experience in keeping that substance, with a rationale of the changes which occur in it, and the means of preventing its decomposition.

The paper of Prof. Thomas, on a new Garlic, gives a very satisfactory argument in favor of its being a hybrid between the Garlic and Leek.

John Faber's paper, on manufacturing Pharmacy, points out the duty of pharmaceutists to watch their own galenical preparations, and gives an estimate of cost, of several kinds, to prove that they can be made cheaper than the market prices of the extracts manufactured on a large scale.

Dr. Pile's paper, on Dicas' hydrometer, is accompanied by tables, which will prove highly useful to those who have occasion to test this instrument.

Of the various other papers, the following may be enumerated: On Citric Acid, by C. T. Carney; on the production of Alcohol in the United States, by F. Stearns; on Paraffin as a substitute for wax in Cerates, by C. T. Carney; on the depreciation of Smyrna Opium, by P. Wendover Bedford; on Atropia from American Belladonna root, by William Procter, Jr.; on Hops and Lupulin, by Charlse A. Tufts; on Patents in their relation to Pharmacy, by Edward Parrish; on the preparation of Narcotic Fluid Extracts, by John M. Maisch; and on Powdered Camphor as a pharmaceutical preparation, as among the more prominent. None of the papers in this volume are very elaborate or very strongly marked, a fact owing to the character and moderate scope of the subjects treated. The work is well gotten up, and, though less in size than last year's Report, is creditable to the body from which it emanates.

The Physician's Pocket Memorandum for 1860, by C. H. CLEAVELAND, M. D., Cincinnati, 1861.

This is another example of the Physician's Memorandum Book, containing about 87 pages of printed matter, useful to the practitioner as a reminder in emergencies, etc.

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